'It is very pretty. Why do you call it Wind flower?" *Page* 23.

WORDS BY THE WAY-SIDE;

OR,

THE CHILDREN AND THE FLOWERS.

BY

EMILY AYTON.

WITH

ILLUSTRATIONS BY H. ANELAY.

LONDON:
GRANT AND GRIFFITH,
SUCCESSORS TO NEWBERY AND HARRIS,
CORNER OF ST. PAUL'S CHURCHYARD.

M.DCCC.LV.

LONDON:
PRINTED BY J. WERTHEIMER AND CO.,
CIRCUS PLACE, FINSBURY CIRCUS.

CONTENTS.

CONTENTS.

* ERRATUM.—An error occurs in the *numbering* of the Chapters in the book—No. XVI. being omitted.

WORDS BY THE WAYSIDE;

OR,

THE CHILDREN AND THE FLOWERS.

CHAPTER I.

I WOULD not merely dream my life away
In fancied rapture, or imagined joy;
Nor that a perfumed flower, a dew-gemmed spray
A murmuring brook, or any prouder toy;
Should for its own sake, thought or song employ:
So far alone as Nature's charms can lead
To Thee who formed them all, and can destroy,
Or innocent enjoyment serve to feed;
Grant me to gaze and love, and thus thy works to read.

BERNARD BARTON.

THERE was an unusual excitement among the little family of Hamiltons on a certain fine evening in spring, for a new governess was expected to arrive. Numerous were the speculations as to what sort of person she would prove to be, how she would look, who she was like, etc.; and many were the questions with which poor mamma was assailed, the only one of the party who had ever seen the lady in question. Eight o'clock came (the appointed hour), and no Miss Vaughan yet. Little Fanny begged so earnestly to be allowed to sit up only half an hour longer, that the petition was granted; and when at last she was obliged to follow Nurse, she could hardly be comforted. Before her eyes were shut, however, the news was brought to her, that Miss Vaughan had really arrived; but Fanny must not expect to see her that night. Early in the morning, the little girl crept into her sisters' room, to inquire whether

they had seen her yet, and whether she was cross or kind-looking; but they had seen her only for a few minutes, and could hardly form an opinion; and Fanny was obliged to wait. Very soon, however, all impatience was satisfied; for Miss Vaughan joined them in the school-room to breakfast, and began in the kindest manner to make acquaintance with the little pupils. These consisted of three girls, whose ages were eight, twelve, and fourteen; they were amiable and affectionate children, but not very forward for their years in general knowledge. Their abilities seemed good, but their minds had not been carefully opened; they had indeed been taught a great number of things from books, but they had not been taught at the same time to reflect upon what they learned, and thus to gain ideas for themselves. In short, their memories had been crammed, while their observing and reasoning powers were suffered to lie asleep; and so it happened, that although they had learned an immense number of difficult lessons, and read through many volumes of long histories, they still knew very little indeed about the things daily passing before their eyes, and thereby lost a great deal of interest, and a great deal of real happiness. The cause of this was evident; they had passed the greater part of their lives in the immediate neighbourhood of a large town, their amusements depending chiefly on society, and on the morbid excitement of a juvenile circulating library. They were ignorant of the purer and higher pleasures which Nature has in store for such of her children as seek her in her works; and it must be said, the prim daily walks on the dusty high roads, had not been a likely means to create a relish for what they

understood by the term "country life." It was, therefore, with feelings of small satisfaction that they left their gay friends in Manchester, and came to reside in a beautiful but very retired spot in the south of England. All this was quickly made manifest to Miss Vaughan in the course of the conversation which now took place with the little girls.

The first glance had satisfied Fanny that the new Governess was certainly not cross; indeed, she felt almost sure that she never could be angry at all; her voice was so kind, and her smile so sweet and gentle: it was almost like their own Mamma's. They all felt sure that they should get on very happily with her; and were soon eagerly describing and talking over their course of daily occupations, lessons, rides, walks, etc. To the latter they seemed to give the least preference, although it was unfortunately made a great point of by their parents, that they should spend two or three hours of every day in taking exercise; but walking they said was so dull and monotonous when they had no friends to go and see, or shops to look into, and besides such a great waste of time. Miss Vaughan thought quite contrary; she liked nothing so well as rambling about a beautiful country, and she hoped to be able to make that part of the day's duty more agreeable, if not more useful and improving to them than any other. She felt much encouraged by the pleasing and intelligent looks of her little friends, and trusted to be able to remedy the apparent defect in their training, by leading them into the path of true wisdom; and by opening their ears to receive the speech which day and night uttereth, and whose voice is unto the ends of the world.

CHAPTER II.

I COME, I come! You have called me long,
I come o'er the mountains with light and song.
You may trace my steps o'er the wakening earth,
By the winds which tell of the violet's birth:
By the primrose stars in the shadowy grass,
By the green leaves opening as I pass.

MRS. HEMANS.

"CAN anything be more dull, more dreary, or more monotonous, than this morning walk that we are doomed to?" asked Dora, by the way of opening the conversation, as the school-room party left the house together a few days after Miss Vaughan's arrival. "How cold, dirty, and disagreeable it is; nothing to be seen, and no object in view but to get back again, and at the end of two long hours. Rainy weather is dull enough; but really I would rather be shut up in the house all day, than walk out in the country at this time of the year: one can read and amuse one's self within doors."

Miss Vaughan appeared to differ very much from this openly declared opinion of Dora's, though she did not contradict her; her look was cheerful and amused; she chatted gaily to the shivering children, and shewed them signs of the coming spring, how the leaf-buds were already starting into life, promising that soon the now dreary landscape should put on its beautiful spring garment, when all would be joy and gladness. For some time they walked on at a brisk pace; and gradually the spirits of the little party

seemed to rise with the colour in their cheeks. At length Miss Vaughan stopped to observe something in the hedge.

"What are you looking at, Miss Vaughan? There are no flowers out yet, I am sure."

"Do not be too sure, Mary, for I think we may find a great many if we look for them; here is one that has already ceased blowing, and spent the greater part of its little life; it is called *Whitlow Grass*; it will soon shed its seed, and wither away."

"How early it must have bloomed; what sort of flower was it? I don't think I ever saw it."

"It was such an humble little flower, that you would hardly see it without looking for it; it blossoms in February and March: but many trees, as well as plants, are in seed now. Mary, look at that Elm; what do you see on it?"

"I see a number of young leaves upon it, but I see nothing like seed."

"Those green plates hanging from the bough are not leaves, Mary, they are the seed vessels of the tree; in the centre of them lies the seed itself: in a very few days the wind will scatter them all away, and then the leaflets will appear; they will be of a brighter and darker green than these seed vessels."

"But how will the seeds be produced? There were no flowers on the tree before."

"O yes, the elm trees were covered with purple flowers more than a month ago; I wonder you did not observe them."

At this moment Fanny came running up with a joyful

expression. "Look," she said, "I have found a Forget-me-not."

"No, my love, the Forget-me-not never makes its appearance till summer comes. That little light blue flower is one of the numerous family of the Speedwells: it is called Ivy-leafed Speedwell, because its leaves are shaped like those of the Ivy. There is a great variety of these little blue flowers; and people not much acquainted with plants, are apt to call them all Forget-me-nots very erroneously. The true Forget-me-not is an aquatic plant; that is, it grows only in water, or in very marshy ground. It is distinguished from the Speedwell family by its long narrow leaves, which have obtained for it the name of Mouse's-ear, or Scorpion-grass."

"And is there a family of Mouse's-ear, too, like the Speedwells?"

"Yes; the Forget-me-not is one of a family, but it is a much smaller family than that of the Speedwells: of the latter there are no less than eighteen species, and of the former only eight. The one which much resembles the true Forget-me-not is a little brilliant blue flower, that blows in fields late in the summer; the only perceptible difference being, that it is much smaller: it is called the Field Forget-me-not. I should like to teach you their Latin names, which would help you to distinguish the different species better than the English ones, but I am afraid of puzzling your memory too much; still I think you may try and remember that *Myosotis* is the botanical name for the Scorpion-grass genus (or family), and *Veronica* for that of the Speedwells."

"*Myosotis* and *Veronica*. Yes, I am sure we can remember that *Myosotis* sounds like mouse, so we shall know that that stands for the Mouse-ear family; and *Veronica* is the family name of my dear little blue flower, and its own particular name is Speedwell. Do you know I am almost sorry that it is not 'Forget-me-not,' because that is so pretty; I don't like 'Speedwell' near so well."

"I have sometimes," said Miss Vaughan, "heard it called Eyebright, a name which seems to suit it very well, but which does not belong to it any more than Forget-me-not. Ebenezer Elliott, who has written a poem called the 'Excursion,' has fallen into this mistake, for he evidently alludes to the Speedwell when he says—

'Blue Eyebright! loveliest flower of all that grow
In flower-loved England! Flower, whose hedge-side gaze
Is like an infant's! What heart doth not know
Thee, clustered smiler of the bank! where plays
The sunbeam with the emerald snake, and strays
The dazzling rill, companion of the road
Which the lone bard most loveth, in the days
When hope and love are young? O come abroad,
Blue Eyebright, and this rill shall woo thee with an ode.'

Now the real Eyebright, or *Euphrasia*, as it is called, is not a hedge flower. It grows generally in plains, in a chalky soil, or on the edges of cliffs."

"So, then," said Mary, "poets are not always botanists."

"No; but I think they ought to be. It seems a pity that those pretty lines should be spoiled by a mistake."

They were now passing under an avenue of Oaks, on one side of which was a copse, thickly strewn with dead leaves.

Miss Vaughan remarked, "How pleasant it would soon

be to wander there, and what a number of flowers they would find, when the leaves on the ground were gone."

"What will become of them?" asked Fanny.

"Many of them will rot and mix with the soil, or be grown over with moss; but the greater number will be blown away by the wind into ditches and hollow places, where they will crumble away by degrees, and form a rich and valuable manure, which will nourish the roots of the trees, and send up sap into their trunks to form fresh leaves for the next summer."

"Then the new leaves of one year are actually made out of the old leaves the year before."

"Yes, they are produced from them; and that is a deep thought, Mary. Nothing that has once been made is ever destroyed. When it dies away, the elements that composed it still exist somewhere: they are changed only to appear again in some new form. To me this has always seemed one of the strongest of natural grounds for believing in the immortality of the soul. We *know* that our bodies, when they are placed in the ground, do not utterly perish; their elements, like those of the plants, must still exist under some form somewhere. How unlikely, then, that the spirit that ennobles and animates the senseless clay—the thinking part of us—should be the only part to perish. We know, of course, because we have it on God's own word, that our souls will never die; but I mean, that also without this revelation we might almost know it, from observing the operations of nature."

"And that is what is meant by natural religion, is it not?" asked Dora.

"Yes; for 'the invisible things of Him, from the creation of the world, are clearly seen, being understood by the things that are made.'"

"But do you mean to say, Miss Vaughan, that nothing in the world is ever destroyed? For instance, are not coals and candles destroyed when they are burnt out?"

"No, certainly not; they are no more destroyed than plants are when they die. The elements of the coals and candles are not consumed; they are only decomposed, and remain still in the room."

"But how can that be proved?"

"It can be proved very easily by the science of chemistry. All the materials, that is to say, the gases of which the coals and candles were composed—the hydrogen, the carbon, and the oxygen gas—can be collected together again; and then, what appears still more strange, it will be found that their united weight has increased, instead of diminished, by the process of burning. But we must study a little chemistry together, before you can fully understand that part of the subject."

"Well!" exclaimed Mary, "since nothing can be destroyed, I should like very much to know what has become of all the acorns that we used to find strewed about this avenue in the autumn. Don't you remember, Fanny, what numbers we used to pick up?"

"Yes; I suppose they have rotted into the ground like the leaves."

"I should hardly think so," replied Miss Vaughan, "because, unlike leaves, they have an inner life, which keeps them from decaying: they are intended to be pre-

served alive a long while, and are therefore encased in strong durable shells. Seeds seldom rot; seldom, at least, under a very long time."

"What do you think, then, has become of them?" said Mary.

"I dare say the poor people collected as many as they could for their pigs and poultry to fatten upon; and what they left supplied food for hundreds of birds; rooks especially, many of whom bury them in the ground for a winter store; and in this way I have no doubt that thousands of oaks and other trees are planted."

"What clever birds!" exclaimed Fanny; "they forget, I suppose, to come back to their store-house, or perhaps planted more than they could eat."

"Then I suppose," said Dora, "it is this inner life that you were speaking of that has preserved the Mummy Wheat so many years. When I first heard that some of that wheat had been planted, and actually come up, I could not believe it to be true."

"It is perfectly true, Dora, though very, very wonderful. Mr. M. F. Tupper was, I believe, the first who succeeded in rearing some of this wheat; and it proved to be of a very superior quality: not only wheat, but peas also, which had been hermetically sealed up in those mysterious cases for thousands of years, have been lately reared; they were green all the year round. This is one of the most astonishing instances of the power of the vital principle, the inner life, as I first called it. But I could give you many more. There is a plant called *Vitis Argonista,* which will grow after its roots have been immersed in boiling water: and even peas

and beans have been known to grow after boiling. And is it not equally wonderful that *Snow-drops* should expand their blossoms beneath a casement of ice, as they are known to do? And that *Sea-weed* will produce its brilliant green hue at the bottom of the ocean, where neither light nor heat can act upon it? I could tell you a tale of an Elder-tree, that would very much tax your powers of faith I fear: I do not tell it to every one, for I believe that those who are unacquainted with nature, would question the probability of it."

"O do tell us, if you please," said Dora; "indeed we can believe anything after the Mummy Wheat."

"You may, believe, my dear, that I will never tell you anything as a fact, that I am not quite convinced of myself. This instance did not come under my own personal knowledge, but I had it on such very good authority, that I cannot doubt its being quite true. Some Elderberries, from which wine had been made, and which were of course mashed and squeezed, and also strained under the operation, were planted by way of experiment, in a gentleman's garden, in the neighbourhood of Matlock. Out of a great many seeds, two or three came up, but only one lived. This one grew up a hardy flourishing tree. But the most incredible part of my story is yet to come. It happened that a stack of hay was placed for support against this tree: one day the stack took fire, and was burnt to the ground; the tree was scorched to the very roots; its owner, whose father had planted it, was much vexed at the circumstance; but finding it so much injured he was compelled to cut it down, and the small bit of stump that remained was made to form

part of a gate: when behold, after several months the gate-post began to grow, and put forth leaves and branches! and I am told that this curiosity is existing still."

"Well that tree certainly had a charmed life; but, Miss Vaughan, don't you think it just possible that the berry from which it grew managed somehow or other to escape squeezing among all the rest, so that its inner life was not affected?"

"No, I am sure that every berry that was planted was broken and bruised, as the thing was done purposely for the sake of experiment: but I think it likely that this berry happened to be less bruised than the rest: something must have remained within it, for we are sure that there could be no vitality existing in the skin only. But here we are now at home; and I must reserve what else I had to say on the subject for a future walk."

"What a pleasant one we have had to-day," observed Mary.

"Yes, we have quite enjoyed it," replied Dora, who appeared to have forgotten her miserable sensations on starting.

CHAPTER III.

THOU art, O God, the life and light
Of all this wondrous world we see;
Its glow by day, its smile by night,
Are but reflections caught from Thee!
Where 'er we turn Thy glories shine,
And all things fair and bright are Thine.

MOORE.

"WELL, Miss Vaughan," began Fanny the next morning, "do you know I told papa the story about the Elder-tree, for I could not help it: but I made him promise first of all that he would believe what I was going to tell him."

"But that was rather unreasonable, Fanny."

"Yes, so he said; but I told him that it must be true, because you said so; and you knew all about it. And then he said he would try to believe it, if you said so. And when I told him the story, what do you think he said? Instead of being very much astonished, he said he could believe it very easily; and then he told me another story, about some apple pips. He said that one day when he was a very little boy, he took four pips of a roasted apple and planted them in his own garden, expecting to have four Apple-trees; and sure enough one out of the four came up, and grew into a tree. Every one thought it very wonderful; and so should I if you had not told me about the Elder-tree, and the Peas and Beans, and the Mummy Wheat."

"The force of the vital principle," replied Miss Vaughan, "is indeed wonderful: it is a self-existing principle; it can

sleep in dark caverns, and beneath the ice; beneath the earth, and beneath the sea. Fire cannot scorch it, and electricity cannot prevail against it! It will overcome everything while it exists; but once destroyed, it can never be restored; for the principle of life is the gift of the Supreme Being alone. When you plant the Rose, you cannot give it vital power. *He* must give it: and when it withers on the stalk, you cannot restore that living principle: *He* has taken it—it is gone! dried up! perished! This is so self-evident and plain a truth, that you would not suppose any one could think of denying it: yet it has been denied by a very talented and learned man. *Liebig*, the celebrated German chemist, gravely told us (some years ago), that fruits as well as flowers were merely the combination of certain chemical ingredients, and that the time was approaching, when Peaches would be sold in the apothecaries' shops, made by his own hands."

"But how could any one believe a thing so absurd? exclaimed Mary; "a clever man too."

"It is only one among many instances of the weakness of human reason, Mary, and a warning to us how cautiously we ought to receive new theories, since the wisest among us have been misled by them: and I am very glad to be able to tell you, that the cloud which darkened for a while the intellect of this really great man, has passed away. Liebig has returned to the path of true science, and is now convinced that the time he foretold will never come."

"I am very glad to hear that he has come back to his senses," said Dora; "but I must say, it seems very difficult

in these days to know what we are to believe, and what not; we hear of so many wonderful things that are true, and that are yet quite as difficult to understand as Leibig's theory about the Peaches."

"They may appear so to you, my dear, because you have had no experience, and are quite ignorant of science: but yet everything that is true is capable of proof; excepting the doctrinal parts of Scripture. In the Bible we meet with truths that we dare not question, but which our minds in their present capacity, are not able to comprehend: we must believe without understanding; remembering for our comfort, that though we now 'see through a glass darkly,' we shall in heaven 'know even as we are known.' It has been well said, that 'there are depths in our holy religion, which men have lost their souls in denying, and in which others have lost their senses in endeavouring fully to understand.'"

"Yes, I can quite believe that," replied Dora; "but in other things how am I to know what is capable of proof?"

"We have one unerring guide; whatever doctrine you perceive to be in the slightest degree opposed to Scripture, immediately reject, however learned or great may be the authority from which you received it; this is the opinion of those who are older, wiser, and better than yourself; those who love you, and in whom you have reason to confide, must be your safest help in every difficulty."

"I do believe I spy a Primrose!" exclaimed Mary, "on that bank the other side of the stream. Shall I try and get it?"

"Certainly, if you think you can without slipping in.

Barbara Jadwiga Public Library

The pleasure of gathering the first Primrose is worth a little trouble."

With some difficulty, and in spite of a few scratches and stings, the prize was secured; and Miss Vaughan made the girls admire, as they never had admired before, its pale loveliness, its scent, and the delicacy of its hue, which is so peculiar, as to have a name of its own assigned to it. "You know," she continued, "that the word is derived from the Latin *Prima Rosa*, first rose, meaning the first flower of the year."

"I thought Snowdrops came first," replied Mary.

"No; you may generally find a Primrose first, if you look for it in some sheltered warm nook. I have found them in January and December, and sometimes, indeed, in the autumn."

Presently they found three or four more Primroses, which Miss Vaughan stopped to gather, for Fanny to carry home as a present to her mamma.

"Why do you gather the leaves with them, Miss Vaughan?"

"For two reasons, Fanny: first, because their light green contrasts so prettily with the flowers; and secondly, because the flowers will live so much longer in water if the leaves are mingled with them."

"How do the leaves make the flowers live longer?"

"I will try to explain it to you. Plants breathe through their leaves in the same way that we breathe through our lungs: they exhale and inhale as we do; that is, they give out and take in air (or gas), and this process is carried on through minute pores (or holes), with which the surface of

the leaves is filled. Accordingly, if you take away the leaves, the plant is deprived of its necessary nourishment, and must soon die."

"I thought all the nourishment of a plant was derived from its roots, and that the leaves were merely ornamental."

"It has not yet been decided from whence it derives the most, whether from the atmosphere or from the soil. The greater part of its nourishment is certainly, in the first place, obtained from the moisture of the ground, which is absorbed by the roots and formed into sap, which may be compared to the blood of animals; but the sap is not yet in a fit state to support the plant: the roots send it up through the stem into the leaves, where, by the process of respiration, that I just now explained to you, it is changed into the proper sort of food, and its colour altered from white to green: it then circulates back again into the stem, and upwards to the flower. So you see that plants not only breathe, but digest their food like animals, and like them, carry on an insensible perspiration through their leaves, or lungs."

"How curious! Can we see the holes in the leaf through which the plant breathes?" asked Fanny.

"Not without a magnifying glass. We will endeavour to procure one, and then I shall be able to show you many astonishing things."

"But how can all this be ascertained about the circulation of the sap?" enquired Mary.

"Like every other discovery, by experiment. If you make a deep cut through the trunk of a tree, you will find juice exuding not only from the cut surface below, but

from the cut surface above also. This proves that the sap both ascends and descends in the trunk at the same time. It is even possible, by means of a little machine applied to a hole in the tree, to ascertain the exact amount of the ascending and descending juices. Dr. Hales contrived to measure the force with which plants exhaled during the summer, and computed that in some plants it was five times as great as that which impels the blood in the crural arteries (which is that in the knee) of a horse; and that a common Sunflower loses by exhalation one pound four ounces in a day; and a Cabbage a little less. He tried another experiment with a bleeding Vine."

"A bleeding Vine! What is that, Miss Vaughan?"

"If you make an incision in the stem of a Vine during the spring, which is the time when the ascent of the sap is the strongest, it will gush out, as the blood would if you cut your arm; and if not stopped, the tree would probably bleed to death. Dr. Hales found that from the incision he made in the Vine, the sap was impelled with such violence, as to force a column of mercury thirty-eight inches high. Again, he attached bladders to the Vine, which filled rapidly, and then burst with an explosion like that of gunpowder."

"I should like to try that experiment. I wish papa had an old Vine, to let us practise on."

"An old Vine would not answer our purpose so well; at least not the old part of the wood. The sap ascends much more vigorously in the young shoots."

"How strange it seems that the sap should go up of its own accord!"

"The light of the sun is the principal agent in drawing up the sap, and causing the plant to exhale its moisture. Now that I have told you this, can you find out for yourselves why, when you pick flowers or fruit, they soon wither away, especially if placed in the sun?"

"I suppose," answered Mary, "the light continues to draw the moisture out of it, and it dies because it cannot get a fresh supply from the root."

"Exactly. Place your bouquet in the dark if you want to keep it, and you will find it live longer, though it must die at last, for lack of nourishment from the root and atmosphere. Place a plant in the dark for some time, and you will see how necessary the process of exhalation is: its system will become weak from excess of moisture; it will gradually lose its colour, and the young shoots will come up almost white, because the sap, not being changed by the action of the atmosphere, retains its original white hue. A knowledge of this fact is made use of by gardeners for the purpose of rendering some plants good for food, which otherwise would be too tough and hot to eat. Celery, for instance, and Asparagus; the parts which are eaten of these plants have been excluded from the action of the light under the soil in which they grew, otherwise they would both be unpalatable, if not unwholesome."

Fanny, who had listened attentively to the first part of the conversation, ran away when she found it becoming too deep for her comprehension, and began to gather more of the Ivy-leaved Speedwell that she had found the day before, amusing herself with twining it among her Primroses.

"Look at my *Veronica*, Miss Vaughan. I don't call them Forget-me-nots now," she added, smiling. "The Forget-me-not is called *Myosotis*, and grows in the water in summer. I remember that; but this is a sweet little flower too. Does it not look pretty with the Primroses?"

"It does, indeed, Fanny; and reminds me of Mary Howitt's pretty lines—

God might have made the earth bring forth
  Enough for great and small,
The oak tree and the cedar tree
  Without a flower at all.

He might have made enough, enough
  For every want of ours—
For luxury, medicine, and toil,
  And yet have made no flowers.

Then wherefore, wherefore were they made,
  All dyed with rainbow light;
All fashion'd with supremest grace,
  Upspringing day and night?

Springing in valleys green and low,
  And on the mountains high;
And in the silent wilderness,
  Where no man passes by.

Our onward life requires them not,
  Then wherefore had they birth?
To minister delight to man,
  To beautify the earth.

To comfort man, to whisper hope,
  Whene'er his faith is dim;
For whoso careth for the flowers,
  Will much more care for Him.

CHAPTER IV.

"Now the bright morning star, day's harbinger,
Comes dawning from the east, and leads with her
The flowery May, who, from her green lap, throws
The yellow cowslip and the pale primrose.
Hail, bounteous May! thou dost inspire
Mirth and youth, and warm desire;
Woods and groves are of thy dressing,
Hill and dale doth boast thy blessing.
Thus we salute thee with our early song,
And welcome thee and wish thee long." MILTON.

IT was a bright laughing morning in the merry month of May when our young friends set out on their next expedition. Many weeks had elapsed since the last, during which an almost incessant rain had soaked the earth, and rendered walking beyond the gravel paths near the house quite out of the question. Now the weather suddenly changed; dark clouds melted away one after the other from the face of the sky, and showed the clear bright blue beyond looking fresher and lovelier than ever: everything seemed to revive under the soft sweet breath of spring. The birds which enlivened the groves of that richly-wooded country, now carolled joyously, and the lambs skipped about in pure love of life.

"Are they not rejoicing in their birth, Fanny?" said Miss Vaughan, as the little girl tripped by her side; and she repeated the beginning of a little hymn on the words, "God is love," which Fanny had learned to say with her morning prayer.

"Yes, God is love, or why should we
Live on this pretty earth;
Where everything around we see
Rejoicing in its birth.

The butterflies with shining wings
That gaily mount above,
And everything around we see
Tells us that God is love."

"Is that what it means?" Fanny asked thoughtfully.

"Yes, they are happy because they are alive; and the little birds, too, seem to be thanking God for the beautiful world that he has made for them. Do you hear that lark? What a joyous note it is: his little throat seems ready to burst with his song of happiness and praise."

"So it does," replied Fanny; "and I am happy too to be alive." And away she ran to fill her hands with the wild flowers with which the sloping banks of the park were covered, like a living carpet of purple and gold.

Pursuing their way through a wood, Miss Vaughan stopped to gather many a lowly little one that the children would have passed unnoticed, but whose beauty they readily acknowledged when pointed out to them; and with their admiration was often mixed astonishment, that they had never observed it before, or that so many of the same colour and outward appearance, which they had been accustomed to call by one name, were in reality quite different, both in form and species. Her deep interest in flowers had at first very much surprised them; every fresh one they gathered brought each a happy smile to her face; one would have thought it was some loved and long absent friend that she was welcoming again.

"O here is my favourite little Wind-flower!" she exclaimed; "better late than never; but it ought to have been here a month ago; the cold rains have kept it back."

"It is very pretty: why do you call it Wind-flower?"

"It is the *Wood Anemone*, Mary, but I like its poetical name the best; I do not know why it is so called, but I fancy it must be because it does not mind the strong winds of spring which blow over it, but only shakes its little delicate head, and seems rather to enjoy it. And there is the *Stitch Wort*, or *Satin-flower*, as some people call it."

"What those little white flowers? I thought they were called Star of Bethlehem."

"Because they look like stars, I suppose. No; their botanical name is *Stellaria*, from *Stella* a star. The Star of Bethlehem is not often found growing wild, though it is a very common garden flower; it is not a native of England, and wherever it is found not in a garden, it has probably escaped from cultivation. The flower is quite different to this, though also star-shaped. Remember this is called the *greater* Stitch Wort; we shall find another in June, called the *lesser*, bearing a similar flower, but much smaller, and the leaf is different. I recommend you to write down the name of every flower you learn in your little pocket tablets; it will help you to remember them."

The girls readily took the hint, and found it a great amusement; they were anxious to outvie each other in the length of their lists, and began to hunt in all directions for flowers for Miss Vaughan to name. Stooping down in a meadow to pick a small yellow one, Mary's eye was attracted by a particular ear of the tall grass growing above her head: she picked it, and, for the first time in her life, began to think how beautiful it was; its colour was a pale pink, and from its slender stalk hung rows of little bell-like

trembling flowers, tipped with orange, and covered with a bloom so delicate, that every motion, even the breath from her lips shook it off. Presently she found another of a violet hue, another brown, and another green; the blossom of each grass was quite different, and all but the green were covered with dust.

"Do look, Miss Vaughan, at this pretty grass; they are all four quite different: I did not know there were so many kinds of grass before."

"A great many indeed, Mary; botanists have reckoned more than two thousand different species."

"Do you mean to say, Miss Vaughan, that there are two thousand different grasses growing in this field?"

"By no means, Mary; though there are a greater variety even here than you would readily believe. Of these two thousand there are two grand divisions, natural and artificial. Of the grasses that you see here, all that grow wild in the fields are natural grasses."

"And what, then, are the artificial?"

"They are those which yield corn, such as wheat, barley, rye; also red clover, trefoil, tares, lucerne, yarrow, and various others, all of which are sown from seed; sometimes separately, sometimes mixed, according to the nature of the soil, or the purpose they are intended for. The sugar-cane also is a grass, and a most useful one. The structure of these little plants, though perfect, is very simple. A stem clothed with alternate thin stalks, leaves, and sheaths, to guard the young and rapidly growing shoots; a cluster of flowers at the summit, with a very small number of stamina, and a single seed enclosed in a thin husk, are all that nature

provides to enable these plants to preserve their race, and to distinguish their numerous kinds from one another. Simple as their appearance is, the different species are so precisely marked, that the natural order of grasses is perhaps one of the easiest for the botanist to study and arrange. This is, no doubt, one of the wise provisions of Providence, by which man is enabled to distinguish good from evil, the useful from the useless; for in no class of plants is it more necessary than in grasses to know how to choose between different species; for instance, most grasses are very wholesome for cattle, yet there are some which would be hurtful to them, and these are so plainly distinguished in appearance that they are easily separated. And there is a great difference also between the value of grasses for pasture: certain kinds suit the meadows, others marshes, others uplands, fields, etc., and others thrive on bleak barren hills, where they furnish valuable food for sheep. All these kinds will not grow together, because they require different situations; therefore it is most essential that the farmer should be able to discriminate between them, but if these different species resembled each other as closely as many other plants do, it would be difficult for him to do so, for but few farmers, you know, understand much about botany."

"But what is this dust that falls off so? See, my gloves are covered with it."

"That is the seed of the grass which bursts from the blossom when ripe, and the wind scatters it over the ground, on which it takes root, and springs up again."

"That seems very curious," said Mary, looking at the dust.

"There are many wonderful ways in which seed is

scattered," continued Miss Vaughan; "the wind is one means, but birds and animals sometimes help."

"Birds and animals sow seed," repeated Dora.

"Yes, indeed; a great number are swallowed by birds, but not destroyed; they merely carry them away to distant places where they sow themselves. You know that the fruit or covering which contains the seed of any plant is called the seed-vessel: well, these seed-vessels are sometimes (especially in the forests of Africa) covered with spines, sharp, strong prickles, which falling on the backs of the wild animals as they range through the forest, stick to their shaggy hides, and are thus transported miles distant, until the animal in passing through the thick underwood, at length, brushes them off again. And some seeds have actual wings and fly! I have in my possession two very valuable winged seeds, given me by a person who brought them from India, and who ranked them among the most precious things in his very rare collection of botanical curiosities. He told me, that these seeds often flew to a distance of three miles from their birth-place." Mary opened her eyes very wide at this announcement: flying seeds! that was indeed a new idea; she inquired if Miss Vaughan would be so kind as to shew them these seeds on their return home. "I will with pleasure, my love; but we need not go to India in search of flying seeds: look at that Dandelion puff which Fanny is blowing away so lustily; those downy feathers were fastened to the little seed on purpose that the wind might carry it away. You see that even the weeds are cared for by the Almighty, and preserved for their appointed use."

Mary took the puff from her sister's hand, and examined it attentively: but she said at length:

"I never thought about weeds being of any use; of what use can they possibly be?"

"When you know more about the nature and properties of plants, my dear, you will discover that all are either useful or beautiful, if not both. Many weeds are used as medicines; some that are even poisonous, such as the deadly Night-shade; from which is obtained the medicine called *Belladonna,* and Fox-glove, which is *Digitalis.* Others which are not consumed by man, form the food of animals, birds and insects. I know what you are going to say, Mary; you think that certain disagreeable insects, such as snails, slugs, toads, frogs, caterpillars and spiders are of no use to man, and that it would be better if they had nothing to feed upon. But you know, dear child, that God created them all in the beginning, and chooses that they should exist: therefore He provides for them; He takes care that they shall not become too numerous by causing them to prey upon each other; but He will not allow them all to perish. Such noxious things are a part of the curse which fell upon this fair world when sin entered it: blighted and faded it is now, bearing thorns and briars; yet still beautiful, still glorious; still eloquently telling of the love of the Father to the children who have wandered from Him, and pointing out to them the purest pleasures that they are capable of enjoying in their fallen state—the contemplation of His glorious works!"

The girls walked on in silence; they had known nothing hitherto of such pleasures: but they saw the glow that

passed over the usually pale features of their friend, as she spoke the last words; and they began to think (Dora especially) that they should like to enjoy them with her if they knew how. They had nearly reached the house, when Mary and Fanny suddenly remembered the promised exhibition of the flying seeds; and away they bounded through the open door, and across the hall, nearly knocking down the old butler, who gazed after them in speechless amazement, as they scampered up stairs to the door of Miss Vaughan's apartment, where they stood breathlessly awaiting her arrival. She soon appeared with Dora, and smiling at their eagerness, immediately unlocked the box, in the recesses of which the two precious little seeds were carefully deposited. Very beautiful indeed they were, resembling the most delicate of all butterflies; the seed in the centre forming the body, and white gauze-like wings extending from it, of the finest net-work. First desiring the children not to pick them up, as it was hardly possible to touch without injuring them, Miss Vaughan mounted on a chair and let them fly. A cry of delight escaped the lips of all three as the winged seeds fluttered about the room, and after two or three minutes fell gradually to the floor. Warmly thanking Miss Vaughan, they ran away to their mamma to relate what they had seen, and to tell her that they had never enjoyed a walk so much in all their lives.

CHAPTER V.

The rolling year
Is full of Thee. Forth in the pleasing spring
Thy beauty walks; thy tenderness and love.
Wide flush the fields; the softening air is balm;
Echo the mountains round; the forest smiles;
And every sense and every heart is joy.
THOMSON.

"Now, Miss Vaughan," began the little girls as they set off on the following morning, "do tell us all the astonishing things that there are to be told about seeds and flowers. Are there any other seeds as curious as those you showed us yesterday?"

"To tell you all about seeds and flowers, my dears, would indeed be a difficult task, I may say an impossible one; you never heard, I dare say, that Gärtner wrote 300 volumes upon seeds and seed-vessels only, and then said that he considered he had left the subject unfinished."

"Three hundred volumes! then it must take more than a whole lifetime to become a botanist," remarked Dora.

"Yes, indeed; each branch of the science of botany thoroughly considered might occupy a life time; but only a very few individuals have the means, the leisure, or the talent requisite to devote a life-time to such a work: nor is it desirable that many should. We, at least, have various

duties to perform, and only a small portion of every day permitted us to employ in this fascinating study. But I assure you that a very sufficient acquaintance with botany might be made even in this time, sufficient I mean to afford you a great deal of rational pleasure."

"But is not botany very difficult; are there not a great many long Latin or Greek names to remember?" asked Dora.

"There is certainly a great deal to remember, and some pains must be taken, as in every kind of knowledge that we set about acquiring; but the pains in this instance are not very painful, and are immediately converted into pleasure, when once we have acquired a taste for nature; this is what I want to give you: but I am not going to press the study of botany upon you; you shall not learn it at all unless you wish it, and for the present we will go on talking about whatever comes under our notice."

"Now, I wonder whether either of you can tell me what becomes of the seed when it is thrown into the ground?"

"No, do tell us all about it?" said Fanny, who had been patiently waiting to hear something that she could understand, and was just going to run away in despair. "How does the great Oak-tree come out of the little tiny acorn?"

"No one can quite understand that, my love, for it is one of God's most wonderful works: the seed of a tree is like the egg of an animal; and we can no more understand how the earth acts upon it in bringing the tree out of it, than we can understand how the hen sitting upon her egg makes it become a chicken."

"Does no one know?"

"No, love, no one; but I can tell you what you would see were you to dig up a seed after it had been a few days in the ground; you would find that the two ends of the seed had opened, from one of which a tiny green plant was peeping forth, and from the other a number of fibrous threads to form the root. It is remarkable, that whatever may have been the position of the seed, that is, whichever end may have been put into the ground first, the green sprout struggles through the soil upwards into the air, and the fibrous shoots strike downwards into the ground, from whence they send up nourishment to the plant."

"Well, we will try that in our own garden, Mary," replied Fanny; "we will stick in French-beans in all sorts of ways, and watch how they come up. We can easily do that."

"There is more instinct in the vegetable kingdom than you or many people are aware of," continued Miss Vaughan. "You have seen Feather-grass, I dare say?"

"Yes; Mamma has some in the vases in the drawing-room."

"It is of a very pure white; it came from Staffordshire," answered Fanny; "I believe it grows wild there in the potteries."

"I have heard so also, and a most beautiful object it is said to be; but I was going to tell you," continued Miss Vaughan, "that in this little seed there are four evidences of design; four proofs, I mean, that it did not spring up by chance, but that it was cared for by its Almighty Creator. First, the feather which wafts it from its original

home: secondly, the instinct by which it always falls upon a plain; it could not germinate upon the bare soil, so the breezes bear it onward until it finds a place suitable to its growth: thirdly, the law by which in falling it turns round and round spirally, so as to screw itself tightly into the ground. Still you would think that the next rough wind passing over it must upset it; so it would but for another little contrivance, which brings us to the fourth evidence. Fixed to the bottom of the seed is a minute spine, like a little dagger, which, by taking hold of the earth, roots it so firmly in, that nothing but actual violence can force it out."

"Well that is really astonishing," exclaimed Mary, with a bright smile.

"It only seems astonishing to you, my dear, because you have not yet been accustomed to trace out the secret works of God. You know that the Psalmist tells us, that they must be 'sought out of all those who would have pleasure therein.'"

"And are there many more evidences of design in seeds and flowers?"

"O yes, everywhere, wherever we turn; near at hand as well as far off. The seed of the common Pansey has a canopy over it, which protects it from the rain and the rough wind, which might otherwise injure it. As soon as the seed is wholly ripened the canopy falls off, scattering it at the same time to a distance of several yards. Perhaps you will smile when I tell you, that I have heard of it having been gravely admitted by military men, that the position of the seed in falling is, according to the science of gunnery, the right one to secure the widest possible range."

Dora did smile, and looked almost incredulous, but admitted that she was very ignorant on the subject, and unable to refute it.

"But you must not be content to remain in ignorance, Dora; you must be determined to gain knowledge from experience, that you may have a judgment of your own, to enable you to discern truth from falsehood, or, at least, the probable from the improbable. Use your own observation; take nothing for granted that you have the means of proving; and when you have thus become acquainted with the wonders of nature around your daily path, you will have faith to enable you to profit by the deeper researches of others."

"O do tell us something more about the instinct of plants, Miss Vaughan; that is so curious. Will you tell us all about seeds first, and then we can go on to flowers afterwards? I had no idea that seeds could be made such an interesting subject."

"I am very glad you find it so, Mary; but, as I said before, you must not expect me to tell you *all* about seeds."

"O no, not the three hundred volumes," replied Mary, laughing.

"Well, I can tell you a wonderful story about the Rose of Jericho, which grows on the sandy plains of Barbary. Its seed is so organized, that it can expand only in water; yet in its native home, the Desert, the root of this poor Rose is never watered by a single shower. To accomplish her purpose, Nature has recourse to a singular means when the seed is ripe. She lifts up the plant from the ground, root, flower, and all, and carries it away to the river Nile, in whose deep water she plunges it: there it floats awhile

until the seed expands, and when the mysterious process is accomplished, the breeze wafts it back again to its native soil, on which it drops and germinates."

"That is a beautiful story," said Fanny. "Did you ever see that Rose, Miss Vaughan?"

"No, not the Rose, but I have seen the seed, and, in order to prove the fact, I saw it plunged into hot water; it was hard and quite closed up at the time, but in a very few minutes it expanded. Cold water would have answered the same purpose, only it would take a much longer time. This most lovely flower, which is supposed by some to be the Rose of Sharon of Scripture, withers every day under the burning rays of the sun, but revives as soon as moistened again by the dews of night. On this account the ancients gave it the name of *Estatica*, or Rose of the Resurrection, from the emblem they saw in it of the future resurrection of the body. Other botanists believe the Rose of Sharon to be our own common *Cistus*, or Rock-rose, a pretty simple little yellow flower, which I have sometimes gathered on chalky hills, and on the edges of cliffs."

"But why?" said Dora. "I should think it much more likely to be the other growing in the Desert."

"But Monro and other travellers who have visited the Vale of Sharon, report that they found nothing there bearing any resemblance to a Rose unless it be the *Cistus Roseus*, which flourishes in the vale abundantly."

"That is rather against the poor Rose of Jericho certainly."

"Do all seeds require water to make them open?" inquired Mary.

"Yes, all more or less; but for most of them the

moisture which they find in the ground is sufficient. I have seen the cones of Firs expand very quickly in hot water."

"You mean Fir-apples, don't you?" asked Fanny. "I have often seen them looking very swelled and big in the winter after a great deal of rain."

"Very true, Fanny. Some seeds burst open suddenly, with a loud noise. The seed of the *Kara Krobetos*, or Sand-box tree, of the West Indies, explodes in water with a report louder than that of a musket. This is the signal for a general scamper of monkeys, who, grinning and chattering, soon chuckle up the contents of the shell. The natives call it the Monkey's Dinner-bell. I have been told, that one of these seeds in the British Museum being thrown into hot water for experiment, exploded with such violence as to break one of the windows. The traveller Bruce, who has written so many interesting books, gives an amusing description of a fall he witnessed from the Sand-box tree, which I will read to you when we go home. No words, he says, are able to convey an adequate idea of the scene. The running and chattering of monkeys, the screaming of parrots, the universal hullabaloo, and the excitement of the whole creation, were irresistibly ridiculous.

"It must be great fun," said Mary; "how I should like to see it."

"I wish," said Fanny, "there was a Monkey's Dinner-bell Tree in England."

"But you forget, Fanny, that we have no monkeys.

"So I did; but are there any more noisy seeds, Miss Vaughan?"

"Yes, there is that of the Pack-tree, which has a lid that no human power could open, but which bursts at the appointed time with a similar noise and consequence. But the most curious effect of all is produced by the Cannon-ball Tree. On approaching the spot, a stranger would suppose that a party of soldiers had bivouacked there: in a circle round the tree, are piled up what appear to be common balls, but are in reality seed-vessels. A gust sweeping across occasions a fall, the sound of which resembles a running fire of musketry, and can be heard miles distant."

"Do you mean the Calabash-tree? Mamma has some calabashes with curious black figures carved upon them."

"No, that is another kind; a native also of the West Indies. No explosion attends the bursting of the Calabash: it opens gradually when ripe, and the natives cut out the fruit which is useless, and preserve the shell, which makes a capital bowl or drinking-cup, and looks really very handsome when ornamented in the way you describe, which is done by merely cutting away the rind with a knife. In Barbados, there is a musical kind of Calabash-tree, the *Hornandia Sonora*, which the natives style, 'Whistling Jack-in-the-box, and others more poetically, 'the Æolian Harp of the Valley.' Round the top of the nut there is a circular opening, through which the wind enters, and becomes sonorous, filling the valleys with strains of wild melancholy music, very like those of an Æolian harp. These Calabashes are so large, that the negro women sometimes use them as cradles for their children."

"Only imagine," said Fanny, "a seed making a cradle! I never thought there were seeds in the world large enough for that."

"There are seeds of all sizes and shapes. The Trumpet-tree of the West Indies takes its name from the resemblance in the shape of its seed to that of a trumpet. Like the Pack-tree, it has a lid, which is fastened down by a long plug. As soon as the nut is ripe, it forces out the plug, and drops on the ground. I have one of these in my little collection, which I will shew you some day. But the seed of the *Acrona* is the most curious in shape that I have ever heard of: it is that of a human foot!"

"O how odd! have you one of those too?"

"No, Mary, for only one of this singular species has yet been discovered, and that one is in a very small island in the far West."

"There is that tiresome old lodge-gate, I do declare!" cried Mary; "why what a short walk we have had this morning!"

"We have exceeded our time by ten minutes," replied Miss Vaughan, looking at her watch; "but I am glad, Mary, you begin not to find your walks tedious, as you told me you used to do."

"O no, they are not tedious now, when we talk about such wonderful things. But will you promise me one thing more, Miss Vaughan, may we run into the drawing-room before we take off our things, and just have a look at that Feather-grass, and see if we can find the little dagger that you were speaking of on the seed?"

"No, my love, not now; because, as I told you, we are late already; and it is time to begin our school-room duties. I want to give you habits of strict punctuality, because so much comfort depends upon it: however, I have a treat in

store, which will, I hope, gratify all your curiosity. I promise you on the first wet day, an examination of my little precious collection of vegetable wonders. I will then shew you specimens of most of the things we have been talking about to-day."

Mary changed a look of disappointment into a bright smile; and all thanked their kind friend for her agreeable promise as they entered the house.

CHAPTER VI.

"Is this the rugged path, the steep ascent,
That Virtue points to? Can a life thus spent
Lead to the bliss she promises the wise,
Detach the soul from earth, and speed her to the skies!
Ye devotees to your adored employ,
Enthusiasts drunk with an unreal joy,
Love makes the music of the blest above,
Heaven's harmony is universal love;
And earthly sounds, though sweet and well combined,
And lenient as soft opiates to the mind,
Leave vice and folly unsubdued behind."

It was some time before the wet day did arrive, and still longer before the little girls could have another quiet walk with their governess. Visitors came to stay at Ash-grove, bringing with them young people to whom Dora and Mary were obliged to devote themselves out of school-hours. Sometimes they made a riding party with their father, and sometimes drove out in the carriage with their mamma. There were a few walks, too, between, and Mary often found opportunities to steal to Miss Vaughan's side to ask the name of a wild flower, and even to hear something curious about it; but they were soon interrupted again, and obliged to join in some other topic: and Miss Vaughan was always pleased to see them amused, and generally contrived to make the conversation more interesting by her remarks, whatever might be the subject under discussion. At length the friends departed, leaving the girls and Miss Vaughan to their usual round of occupation. The weather which had

been brilliant the last three weeks, was suddenly changed; and the day following the departure of the guests, set in wet and gloomy; "the clouds seeming to rain tears," as Fanny said, "because they were gone." As the hands of the time-piece pointed to the hour when it was usual to close the books and get ready for a walk, Miss Vaughan wondered whether or not her promise would be remembered; she had not long to wait in suspense.

"Now, Miss Vaughan, the day is come at last. You know what you promised us; do let us see your treasures, please," began all three in a breath.

Miss Vaughan left the room, and presently returned with a rather large box, which she unlocked, and began to lay out the contents upon the table.

"You may examine everything," she said, "only carefully; as some of them are very easily injured."

She was soon overwhelmed with questions.

"What is this?" asked Dora, taking up something which looked like a piece of the finest Nottingham lace; "it is lace, is it not?"

"No, it is nothing more than the bark of the Lace-bark Tree of the West Indies. The workmanship is indeed wonderfully beautiful, and its thinness, you see, almost equal to that of lace itself. A great variety of things have been manufactured from bark: here is a piece of paper made of the inner bark of the Mulberry-tree: and here is one of my choicest treasures; these are the leaves of the Budha (the sacred book of the Burmese), made of the inner bark of the Fan-tree. You see how exquisitely they are enamelled."

"And what is this silky hairy stuff?" enquired Mary.

"That is Manilla Hemp in its raw state: it can be spun into a texture of exquisite fineness. I have seen baby linen most beautifully embroidered with it."

"O yes, Dora; do not you recollect seeing some in the Exhibition?"

"I never thought of it since; but now I remember papa telling us that it was made of Manilla Grass."

"This is Irish Flax, you see how very finely it is spun, you can scarcely distinguish the threads; yet this is inferior to what is grown on the Continent. Sometimes the threads are so fine that they cannot be distinguished without a magnifying lens. I have heard of some being sold at £500 the pound weight."

"I think I know what this is," said Mary, holding up a very large seed, shaped like a trumpet; "this must be the Trumpet-tree seed. Does it open? I should like to see inside."

Miss Vaughan drew out the plug, which looked like a long iron nail, and raising the lid, allowed the children to peep into the hollow seed-vessel: the fruit, of course, was gone.

"And I know now what this is," exclaimed Fanny, holding up a bunch of pinky-white feathers.

"This is the Feather-grass, that sticks itself into the ground with the little dagger."

"O so it is," said Mary. "Now let us look for the dagger."

It was easily found; the little sharp spine projecting from the bottom of the tiny seed. To prove its sufficient strength, which Mary seemed rather to question, Miss

Vaughan took up a piece of sponge and dropped the seed upon it: to their surprise, it adhered so firmly that they were unable to shake it off.

There were many more interesting specimens; but as Miss Vaughan found that the discussion of each one would require more time than she had then in her power to bestow, she left the box with her pupils, giving them permission to examine everything by themselves, and promising to answer any questions they might wish to make respecting them at a future opportunity. Mary and Fanny found abundance of amusement in the box of treasures; but Dora, after a mere careless glance over them, took up a book, and ensconcing herself in the corner of a sofa, was soon lost to the presence of all external things, while rapidly devouring its contents.

During half an hour, Miss Vaughan continued her writing in silence, but every now and then she looked anxiously at Dora, who appeared more and more engrossed by the fascinating spell of her book. Presently a tear, which had slowly gathered in her eye, stole down her cheek and dropped upon the page: she seemed unconscious of it, and still read on.

Miss Vaughan turned to the little ones: "Mary, dear, you may leave those things for me to put back, and now run away, both of you, and have a good game at battledore and shuttlecock in the corridor; there is an hour still for play, and you have been standing still long enough. Dora," she said, as soon as they were gone, "what are you reading?"

Dora started as if she had been suddenly roused from sleep. "Did you speak to me, Miss Vaughan?"

"I merely asked you, dear, what you were reading?"

Dora brought the book to her, then sat down again, and burst into tears. Her feelings were over-wrought; and Miss Vaughan thought it better to let them exhaust themselves before she again addressed her. Meanwhile she took up the book, and turned over a few leaves. It was a novel, as she suspected; one of Bulwer's. She laid it down again silently, and for a few minutes appeared to be engaged in deep and perplexing thought. The fact was, that ever since her coming to Ash Grove she had observed Dora's all-absorbing taste for romance, and, at the same time, the injurious effects which the indulgence of this taste were silently, but surely, working upon her character. Naturally indolent, and indisposed to active employment of mind or body, but, at the same time, sensitive, affectionate, and imaginative, Dora's disposition was just suited to the reception of this insidious poison; and her appetite grew by what it fed on. How was she to prevent the mischief? It would have been easy to take away the book in question, and to prohibit the reading of any other without her knowledge; but the difficult point in the present case was, that Dora's mother not only permitted her to read novels, but often put what she called well-selected ones into her hands herself. Miss Vaughan felt that the only chance of rescuing her young charge from the evil that threatened her was, in explaining to her, if possible, what that evil was, and bringing her, upon the conviction of her own judgment, and by her own act and effort, to renounce the temptation.

"You are not going to take it away from me, Miss Vaughan?" asked Dora, as soon as she had dried her tears.

"You know, Dora, that I have always objected to your

reading books of fiction alone. This is one from which (to say the least of it), you can gain no good, therefore to read it must be a waste of time."

"But we cannot be always learning; this is my own leisure-time, and may I not amuse myself in it in my own way?"

"In any way that is harmless you may certainly: when amusement is harmless it is not a waste of time, but good and necessary. But you are mistaken, Dora, in saying that you cannot be always learning; you *must* be always learning. Your mind is always thinking, even when your body is unemployed; you are ever working out ideas for yourself, and forming opinions and principles by which your character is forming—by which your whole life will be influenced. Is it not, then, important that the food on which your mind feeds and grows should be pure and wholesome food?"

"Yes, of course; but I do not wish to read books that are not pure and proper. I know that some are not, and I do not like them. I don't think I have any taste for what is improper."

"But you are not able to judge of what is proper, my dear child; from a coarse or indecent style of writing, I have no doubt that you have sufficient good taste to turn away. It is not that evil that I am alluding to now."

"What is it, then? Do tell me all you have to say against novels. Really I don't ask you for the sake of arguing, for somehow I generally find that you are right in the end about things; and I think, perhaps, that if I could be made quite sure that I was doing wrong in reading whatever I like, I might be induced to give it up."

"If that is really the case, my love, I will gladly try to make you understand what my objections on the subject are. I would far rather convince your understanding and conscience, than enforce your obedience merely; much rather that you should give up a pleasure, because you feel it to be wrong, than because I forbid it, because the time will come when you must act upon your own judgment in many things, and stand or fall by your principles, perhaps without any earthly guide. You know, then, that the test by which we should first weigh every action of our lives is, 'What is the will of God concerning it?' Now which do you suppose is most acceptable to God, that we should study the inventions of man's fancy, or His own glorious works?"

"Of course the latter; but why not both? May we not study other things as well, if they are found to be innocent?"

"Yes; but should not the works of God come first? You know that your reason, and all the various faculties that have been given you, are so many talents, for the use of which you must one day render an account. You have admitted to me that you are very ignorant about all created things; and at another time, I heard you confess that you had read through more than one circulating library. Suppose you were going to die now, would this, do you think, give you a comfortable feeling?"

"But I do intend to study all that I ought to be acquainted with. I am learning now a great deal every day; and when I grow up, I hope to know as much as other people."

"But how do you know that you will live to grow up? You are learning a great many accomplishments now; and

inasmuch as your object is to please your parents, and to do your part in promoting the amusements of others, you are fulfilling a duty in learning them. But you must know, Dora, that these are not exactly what is understood by the talents, for which the Bible says we are to be accountable. They must mean our reasoning and our thinking powers, the qualities of our minds and hearts, as well as all the outward gifts of God."

"Yes; I understand that."

"Well, I was going to say, that so much time being given up to the acquirement of accomplishments, but very little remains for the improvement of the mind, which is of much higher importance, and of that little you devote nearly all to the pleasures of imagination; for I am sure, that even while you are reading serious books to me, or while I am talking on grave subjects to you, your thoughts are very often wandering over this enchanted ground."

Dora was silent for a moment or two, and then said—"But if I knew more of what you call important things, would it still be wrong to read such books occasionally?"

"If your mind were (what it is hardly possible at your age that it should be) well stored with useful and valuable knowledge, I would still, were you a child of mine, forbid you to amuse yourself at any time with falsehood."

"Still I can assure you, Miss Vaughan, that I have gained a great many ideas from novels and from poetry; even Lord Byron's poetry, that you do not like me to read; and, indeed," she added hesitatingly, "some religious feelings, too."

"I am very sorry to hear it; very sorry, indeed, Dora. The Bible is the book to teach us religion, and no other in

the world. Can you really believe such a man as Byron, genius as he was, to be able to teach anything about religion? or any of the people who spend their precious time in writing useless trash? My dear child, you are in great danger; I wish I knew how to make you aware of it. But if I am unable to convince you by argument, remember at least this, that I once thought as you think now, and that I have lived to find out my error. I tell you from experience, that it is because they are deceitful that they are hurtful. They promise, by their highly-wrought pictures, what earth can never fulfil, though you are loth to believe it now. The world is yet unknown to you; and you form your expectations of it from this bright standard. It is a false one —it will cheat you, Dora: life is not what these books make it out to be; the people are not like, nor the events that you will meet with in it. If you will persist in finding this out for yourself, you must suffer the bitterness of disappointment; and with feelings quickened, hope elated, and pride and vanity stimulated—all unfitted in every way for the sober, every-day duties of life—you will meet with crosses and vexations, which will irritate the more from their very pettiness (as it will seem to you), and then yours will be 'the wounded spirit, which is hard to bear.'"

"No one ever told me this before."

"Then, dear, you have been hitherto not much to blame; but you are warned now."

"But is fiction never to be indulged in at all? Would you consign all novels to destruction—historical ones, for instance?"

"I would not destroy them all, certainly, because many are very beautiful, considered as subjects of taste and genius;

but they are unfitted for the young, 'who must be fed with milk, and not with strong meat.' Historical novels are, for the reasons that I have given you, as dangerous as others: the foundation of the story may be true; but the whole is so varnished over, and mixed up with untruth, that it is no more to be trusted, as a standard of moral opinion, than those which are confessedly fictitious. When you are grown up, and when you have seen enough of the world to know how to estimate it, and your opinions and principles are formed by experience, so that you will measure the book by its agreement with what you have learned to be truth, then, perhaps, you may read romances without injury to yourself, and enjoy their beauties without being misled by their honeyed falsehood. But, then, I would fain hope, my dear Dora, that you will find the active duties of this life, and the preparation for another, to be too engrossing to leave much time for such pursuits; in short, that your affections will be set upon higher things."

Dora's affectionate heart was touched by the tone of earnest feeling in which Miss Vaughan spoke to her; she knew that she could have no motive but her good. She felt, also, the power of truth, which will force itself even upon the unwilling mind; and she was convinced that the arguments she had listened to were unanswerable. "I am sure you are right," she said, "as you always are; and I promise you, Miss Vaughan, that I will not read another novel until you give me leave. I will not even finish this one, although I did leave off in a most tantalising part. But I shall hardly know what to do with myself out of school hours," she added with a sigh.

"You have made a good resolution, my dear girl; and I

promise to do the utmost on my part to help you to fill up the vacancy which must occur in your mind on first giving up a long-cherished indulgence. I know of nothing more likely to do this than the study of nature in any of its various branches; for there are stories, Dora, in the book of creation more deeply interesting than any novel that was ever written, and wonders far greater than those of the most marvellous romances. But it is not in the external world alone that I would have you commune with nature. The mind of man, the noblest work of God, is the highest and most useful of all studies. In the wide field of history you will discover much of romantic interest, with this advantage, it will not mislead you: it is the true record of humanity and of the world. And even if its details sometimes fail to please or elevate your taste, still they will not pervert it. And now, my love, I think we have talked long enough on the subject; with respect to this book, perhaps you would be able more readily to dismiss it from your mind if you knew the final catastrophe, which I dare say winds up all smoothly enough, so unlike the sorrows of real life. I cannot sanction your having it again in your hands; but as a reward for your ready compliance with my wishes, I promise to finish it for you myself, and to relate to you the particulars as faithfully as I can. Not now, for my head aches a little; but I will not keep you very long in suspense."

Dora put her arm round the neck of her friend, and kissed her flushed cheek. "How very kind of you! you shall see how I will try."

"But remember, Dora, that all unassisted efforts are useless."

CHAPTER VII.

O how canst thou renounce the boundless store
Of charms, which nature to her votaries yields!
The warbling woodland, the resounding shore;
The pomp of groves and garniture of fields;
All that the genial ray of morning gilds,
And all that echoes to the song of even,
All that the mountain's sheltering bosom shields,
And all the dread magnificence of heaven,
O how canst thou renounce, and hope to be forgiven?

THE MINSTREL.

"MAY we go down to the river this morning, and look out for Water-lilies?" demanded Fanny, as they were leaving the house a few days after the conversation related in the last chapter, "Papa told me one day, when we were riding that way, that one part of it higher up was covered with them last summer."

"I have no objection to walk that way, my dear," answered Miss Vaughan. "I am rather doubtful whether we shall find any Water-lilies; they do not blossom till July, and this is only the first. However, we can go and try."

"Talking of Water-lilies," said Mary, "reminds me that I wanted to ask you about that curious bit of stuff in your collection, marked 'Water-flannel.' What can that mean? It looks just like a common bit of very coarse flannel, only of rather a dirty colour. It cannot be a plant or a seed, I am sure; and what has water to do with it?"

Miss Vaughan smiled. "I do not wonder at your being

puzzled by it, Mary; and I suppose you will open your eyes very wide indeed when I tell you, that it is a plant after all."

"A plant!" exclaimed Mary and Fanny together. "Why I never knew that flannel grew before."

"This flannel grew, however, to my certain knowledge: and I will tell you a story to prove it."

Fanny, who was just starting off to chase a butterfly, turned back again at the sound of the word "story," and listened attentively.

"Some years ago, I was staying at the house of a friend in Gloucestershire. It had been a very wet spring: the situation was low and moist; and many of the surrounding meadows were quite inundated with water. One morning, on going down to breakfast, I found the whole family assembled together outside the library window, in a state of great excitement about something, and in some alarm. I begged to know what was the matter: they pointed to a field opposite, which was covered all over with a strange whitish-looking substance. We were not near enough to see it very distinctly, and many were the conjectures as to what it could possibly be; it had grown up in one single night whatever it was, for every one was certain that there was nothing of the kind visible on the field the day before. I had heard before of the existence of water-flannel; and it immediately occurred to me, that the phenomenon in question was neither more nor less than a specimen of that curious plant. Breakfast was not to be thought of until some one had solved the mystery; and accordingly I accompanied one or two of the most enterprising of the party in a walk to the

field. It had a very odd appearance when we came up to it. The whole surface of the meadow looked as if covered with one vast blanket. On examination, however, it proved to be the identical Water-flannel, and we brought a large piece home as a specimen. Before breakfast was concluded, the field became crowded with the villagers, who, having never seen anything like it in all their lives, were quite overwhelmed with amazement; and you may suppose, that in a quiet little village where very extraordinary events are of rare occurrence, such a novelty as this would of course make a great stir. It was amusing to watch their astonished looks, and to listen to their various explanations on the subject. Some pronounced it to be the work of insects, occasioned by the unusual continuance of wet weather; others, of fairies; and one old lady shook her head in an ominous sort of manner, and whispered something about signs of the times, but no one knew exactly what she meant: we had some difficulty in persuading them that it was after all an innocent plant. At length the good people began to test its strength and durability, which they found very satisfactory. One woman indeed amused us exceedingly: she gravely measured out the necessary quantity for a petticoat for herself, which she actually made and wore; and a very capital flannel petticoat it proved too. Some others followed her example, and made waistcoats for their husbands."

"But were they strong enough to last?"

"I cannot inform you how long it took to wear them out, as I left Gloucestershire just afterwards, but I should imagine not a very great while; the wonder was, that they would bear the needle and thread."

"With some difficulty, and by dint of parasol handles, the flower was safely reached."

Page 53.

"How long did it remain on the ground?"

"Not many days, I believe; it soon withered away in the sun."

"I wish it would come in some of these fields; I should like to see it."

"It is not likely to do so, I fear. It seems to be an uncommon thing anywhere, for I have met with very few people who have seen it. Aquatic vegetation, to which this species belongs, has many wonders to relate: by aquatic, I mean that which grows in water."

"Then the Lotus must be aquatic, is it not?"

"Yes."

"And I do believe," exclaimed Fanny, "that I can spy one. I see a small white flower swimming on the top of the water in the middle of green leaves; that must be a Lily."

"Yes, that is a Water-lily in bud; it is not full-blown yet; do let us try and reach it."

With some difficulty, and by dint of parasol handles, the flower was safely reached and brought to shore, and underwent examination. The sisters had never seen a Water-lily before, at least so they said; Miss Vaughan thought it most probable that they had seen without observing it, like many other things: however, they observed it well now, and thought it passing beautiful in its pure white dress, contrasting with the large dark green leaf on which it floated.

"It is called the *Nymphea Alba*," said Miss Vaughan, "or White Water-lily. It owes its name *Nymphea* to its growing in clear pools and slow rivers, places which nymphs

were supposed to haunt. It is, perhaps, the most magnificent of all our native flowers. It rises above the water during the day, attracted by the light; and the flower only opens while the sun shines upon it. Towards evening it closes again, and sinks beneath the surface. There is another kind of Water-lily, of a yellow colour, which is called in Norfolk Brandy-bottle, on account of its scent, which is like brandy: it is smaller than this and not so beautiful."

"Is not the water-lily a species of Lotus?"

"O no, quite distinct. The British Lotus instead of being an aquatic plant, is a little yellow field-flower (the Bird's-foot Trefoil), which grows in the meadows in spring and summer; children call it Shoes and Stockings, or Lady's Slipper."

"O is that the Lotus?"

"That is our Lotus, but the Egyptian Lotus (the Rose of the Nile) is a very large aquatic plant. Both in the Nile and the Ganges, it is sown by the natives in the same way in which rice is sown, and with equal care. You remember the words in Isaiah, 'Cast thy bread upon the waters, and after many days it shall return to thee'; and you know the meaning it implies, I dare say."

"I think I do," answered Dora; "it means, that if we do good whenever we are able, whenever we have the opportunity, without seeing the effect of it at the time, yet that we *shall* see it if we wait, at last, after many days."

"Very well explained, my dear. The figure of casting bread upon the water is generally understood to refer to the method of sowing rice; but it is doubtful whether it

may not be sowing the Lotus that is alluded to, for it is a custom equally ancient. Herodotus, who has been called the Father of History, thought it worth while to record a description of it. The seed which is cast into the river, sinks into the clay at the bottom, and is seen no more: but look again after many days, and lo! the foliage develops itself above the waters; the large strong leaf, and the beautiful delicate flower resting upon it."

"How large is the leaf?"

"Larger than any you ever saw. Schomberg says he found a Lotus-leaf at Berbice in South America, which measured more than six feet from end to end: that is more than the height of a very tall man; but the usual size is less than that. There is a Lotus in the Royal Gardens at Kew, on which Mr. Paxton, of Chatsworth, tried an experiment. He wanted to ascertain the strength of this enormous leaf; and for this purpose placed a barrel upon it, which he gradually filled with water. He had poured in ten gallons before the leaf appeared to feel the weight, and then sank slowly beneath the surface."

"Ten gallons! then I suppose if I were to sit upon it, I would not sink?"

"Probably not, Fanny, if you kept your legs up; still I I should not recommend you to try"

"How long the stem must be to come up from the bottom of the Nile!"

"Some aquatic plants have very long stems. Some years ago, I was travelling in the South of France; while staying at Avignon on the Rhone, we often went boating on the beautiful blue river. One day a singular-looking

flower floating on the water attracted my attention: it was pulled into the boat; and the stem was found to measure nine feet from the root to the flower."

"What was its name?"

"Rather a long one for you to remember. It was the *Vallisneria Spiralis.*"

"I shall like aquatic plants," said Fanny, "if they are all as pretty as my Lily, which I shall christen the Rose of the Avon."

"Or as curious as the Water-flannel?" added Mary.

"They are not all as pretty as the Lily and the Lotus, but many that are not pretty, are extremely useful in their power of purifying water. *Draparnaldia* in particular; water after flowing over it is always chemically pure, whatever it may have been before."

"And I too had a question to ask you, about something in your collection," said Fanny. "It was the seed of the Mahogany-tree. The shell (or seed-vessel I believe you call it) was full of small seeds; and they seemed to be all packed up and bandaged round with cotton. I want to know how the cotton came in the shell: did you put it there; or does it belong to it; and what is it for?"

"The first of your three questions, Fanny, is easily answered. I did not put it there; it came naturally: but the last I should like you to try and find out. Now each of you give a guess: for what purpose can the cotton be, in which we find not only the Mahogany seed, but many other seeds so carefully wrapped up?"

"Protection from the cold and rain, perhaps."

"No, Dora, that will not do; it cannot at least be the

main object, as all these seeds are inhabitants of tropical countries."

"I am sure I shall never find out," said Mary and Fanny.

"Why, what is the puff of the Dandelion for?"

"O for wings to carry away the seeds; is that it?"

"Yes, to be sure; it is the design of a prospective Providence, who makes nothing without providing at the same for its preservation and continuance. You understand what I mean by prospective Providence?"

"Looking forward to the future; is it not?"

"Yes, to what is in prospect. The packing up of the seeds, as well as the stuffing and bandaging, that you were talking of, is indeed very curious. No Egyptian mummy was ever so carefully encased as they are. A perfectly mathematical contrivance is displayed, by which every little interstice is filled up, so as to contain all in the least possible space. Just as if nature, or rather the Providence that we were speaking of, had an eye in all this care for its propagation, to the value of the tree to man; of which you may form some idea, when I tell you, that three logs of this precious wood were lately sold to Messrs. Broadwood, the piano-forte makers, in London, for the sum of three thousand guineas!"

"There are no Mahogany-trees in England," observed Fanny, rather doubtfully.

"No, they grow only in the southern parts of East Florida and Honduras, and in the Islands of Cuba, Jamaica and Hispaniola."

"And in Spain," suggested Mary; "surely I have heard of Spanish Mahogany. Yes, to be sure, the dining-table is

made of it; and I heard some one say that it was the best kind."

"No, Mary, you are under a mistake; Spain produces no Mahogany-trees. The wood you speak of comes from Jamaica, from whence the finest sort is obtained. It is called Spanish Mahogany merely on account of the settlements where it grows having belonged formerly to the Spaniards."

"Well, can you believe it, that never struck me before?" exclaimed Dora; "actually, though I knew perfectly well that mahogany grew only in the West Indies, it never came into my head to wonder why any of it should be called Spanish."

"I can believe it very easily, my dear; for I know what the consequence is of learning things from books by rote, and repeating them like a parrot, without reflection. I dare say you did not know that the Mahogany is a species of Cedar-tree."

"No, indeed, I did not: the wood seems very different."

"The principal difference is, that the one admits of a polish, and that the other does not, but is scented instead: but though one grows in the East, and the other in the West, they are of the same family."

"There are some Cedars of Lebanon in the shrubbery, are they of the same kind that Solomon's temple and palace were built of?"

"Yes, the same kind; but very small compared with the magnificent trees that spread their wide branches over the fruitful valleys of Syria; while the mountains above are covered with perpetual snow. They must have a lovely appearance there."

"Yes, but I would not exchange for them, with the Syrians, our Oak and Chesnut-trees," said Mary; who never liked to hear of her own country being outdone in anything, even in trees. "I begin to be very fond of trees, since you made me notice them more particularly; and really think they never *did* look so bright and beautiful as they do this summer."

"Perhaps you have never observed them so lovingly before, Mary; but I quite accord with you in veneration for our English trees. The Oak, I think, for majesty and grace united, cannot be surpassed all over the world. It always looks to me like a living emblem of the spirit of the English people: strong, enduring, lofty, benevolent and practical. How it spreads its wide arms, as if it would gather the tired beasts of the field round its trunk, to shelter them from the heat of noon, dropping food all the while for their sustenance. And how the birds rejoice in its thick beautiful foliage; and how pre-eminently useful it is! Every part of this noble tree has its especial use."

"How is that?" said Dora; "I thought it was only the trunk. I know that ships and houses are built of Oak-wood, but is any other part besides the trunk useful?"

"Yes, indeed, when the trunk is sawn into planks for building, the bark is carefully preserved for the tanner and dyer, who could not do without them. The very sawdust also is serviceable to them. Oak bark is also very valuable in medicine; and sometimes it is used in hot-beds for growing Pines: even the ashes of it are not thrown away; these are found to be very useful in cleansing and purifying wine; and for mixing with hard water to soften it for washing."

"But can anything be done with the roots?"

"O yes, they make capital handles for hammers, knives, etc."

"And the branches?" suggested Fanny."

"They are burned to make charcoal. Those of several other trees are also used for the same purpose. The fruit, as you know, supplies food for pigs and deer; and when bruised, even poultry will thrive upon it."

"People don't eat acorns now, Miss Vaughan; but I know that they used to do so. I have read in my History of England, that the Ancient Britons almost lived upon acorns."

"Yes, Fanny, and the Saxons also, when they first came over to England. They ate them in place of corn, which was very little cultivated in those times. Acorns were then the riches of the land, and a dearth of them was regarded as a calamity equal to a dearth of corn now; for they were not only a means of subsistence to poor people, but were depended upon entirely for fattening the large herds of swine which fed in the forests, under the care of a swine-herd; who tended them as carefully as a shepherd now tends his sheep; for they formed the most valuable part of a Saxon farmer's stock."

"The Oak lives to a great age, does it not?"

"Yes, one was felled in Monmouthshire some years ago, which was ascertained to be 400 years old."

"But how could it be ascertained?"

"In this way; when the trunk of a large tree has been felled, have you never noticed a number of rings all around it? Perhaps not, but some day I shall be able to point them out to you. The Oak, as well as most other large trees,

forms a fresh ring every year, until it arrives at perfection; and it takes generally as many years to decay. The rings in the great Monmouthshire Oak amounted to 400, which proved that the Oak had continued to grow for 400 years."

"Are there many Oaks so old as that in England?"

"No, not many I believe; I do not think they often exceed 100 years. There is one, however, on the estate of the Duke of Portland, which is called the Parliament Oak, from a tradition of Edward I. having held a parliament under its branches; it having at that time attained the respectable age of 1000 years! So at that rate it must be upwards of 1500!"

"But is that really true?"

"It is generally believed to be true; especially as the park in which it stands is known to have existed before the conquest."

"It must have formed a great many rings; how very large it must be!"

"Yes, but there is a larger still, in Yorkshire, which is called the Evethorpe Oak; it is the largest in England; it measures seventy-eight feet in circumference."

"How large is that?" asked Fanny.

"Well, I shall certainly feel a much higher respect for the Oak in future," observed Dora with a smile, as they entered the house; "I always admired it as a fine handsome tree; but I never knew before that it had so much to say for itself."

CHAPTER VIII.

AND yet was every faltering tongue of man,
Almighty Father! silent in Thy praise;
Thy works themselves would raise a general voice,
Even in the depths of solitary woods,
By human foot untrod; proclaim Thy power,
And to the choir celestial, Thee resound;
The eternal Cause, Support and End of all.

THOMSON.

"I HAVE been thinking, Miss Vaughan, about the age of the Oak being ascertained by the rings in its trunk, and I do not quite understand it. What makes these rings in the first place?"

"The rings, Mary, are merely layers of wood which compose the trunk; a fresh layer being added each year, leaves this circular mark or ring, which is easily counted."

"But why do not all trees and plants do the same?"

"Because all do not form their new wood in the same manner. Now pay great attention, and I will teach you a little bit of botany, that will make the subject clear to you. Don't look frightened, little Fanny; we shall have only three hard words to remember. Botanists have divided the whole vegetable kingdom into three grand classes, *Dicotyledonous*, *Monocotyledonous* and *Acotyledonous*. *Cotyledon* means *lobe*, and *Di* means *two*: so the first class includes all those plants whose seeds are composed of two (or more) lobes."

"But what are lobes?" inquired Fanny.

"When the Mustard-seed in your garden began to peep above the ground, what was the first thing you saw?"

"Why, the seed had burst open in two halves, and there was a little green thing in the middle between them; I don't know what became of the two halves, but I suppose they withered away: I think it was the little green thing that grew up with the Mustard-seed."

"Those two halves, as you call them, were the lobes, or *Cotyledons*, and shew that your Mustard-seed was a *Dicotyledonous* plant. This is by far the largest class of the three. A great number of flowers, and nearly all British trees belong to it."

"I think," said Dora, "I can guess what the second class means; *Monocotyledonous*. *Mono* must stand for *one*. Does it not include all the plants whose seeds are composed of one lobe, or *Cotyledon*?"

"Perfectly right. To this class belong all the Grasses, the Rushes, Fungi, Lilies, and many aquatic plants. To the *Acotyledonous* belong the flowerless plants, and Ferns, Sea-weeds and Fungi. But we have nothing to do with that class at present. Now the *Dicotyledonous* plants (the large class), are distinguished by another peculiarity besides having two lobed seeds, which is, that the growth of their stems is on the outside of the pith, in circles round it. All trees of this class, form their new wood in circles round the outside of the trunk, beneath the bark: consequently the outer part of the tree is the strongest, and the inner part is that which first begins to decay. In *Monocotyledonous* plants there is no pith in the stem, and the growth proceeds from the centre instead of the outside. The stem

increases in length, but scarcely at all in diameter: it only becomes harder and firmer. Now, do you see how the circles are formed round large trees? and how they differ in their growth from plants of the other classes?"

"Yes, I understand quite well now; but are there no large trees of the second class?"

"Not any natives of this country. The Palm-tree, and many tropical trees, belong to it."

"Then you cannot ascertain the age of those trees?"

"No, not by this rule; nor can the rings of *Dicotyledonous* trees be as well depended upon in hot climates; because there being no winter, the wood is constantly forming, and leaves no mark of the yearly growth. Some people, for want of considering this, have made most absurd mistakes, in trying to calculate the ages of Indian trees; giving to some the age of 5000 years, which is known to be quite out of all reason. It is only in the temperate climates that this mode of measurement may be relied on; and even there it sometimes fails. Occasionally, when the trunk of a felled tree is examined, the rings are found to coalesce; that is, unite together in one line: but that does not often happen. Sometimes it is even possible to give a a guess at the prevailing weather the tree has experienced in each particular year of its growth."

"How can that be possible?"

"In this way: sometimes we find that the centre growth is not the centre of the circles; I mean that the circles, instead of following each other at equal distances round the centre, are compressed, or nearer together on one side than they are on the other; because the layers of wood are thinner

on that side than on the other: now what could have made them thinner?"

"I cannot guess," said Mary.

"It must be the blast which checked their growth; and therefore it follows, that the wind on the thin side of such a layer must have been the prevailing one during the year in which that layer was formed. For instance, if the wind blew frequently from the north during one summer, there would be a larger formation of wood on the south, than on the north side of the tree in that year."

"Well, I never should have expected to find an old weather almanack inside the trunk of a tree," exclaimed Mary, laughing.

"And yet," added Dora, "it seems very simple and natural in the way Miss Vaughan has explained it."

"Do you know why the Oak is particularly used in ship-building?" said Miss Vaughan.

"Yes, on account of its strength, I suppose."

"Not exactly; it is because it is the only wood that does not injure by the action of water. And how many Oaks do you suppose are contained in a man-of-war?"

"I cannot guess; a great many I should think."

"No less than 2000 trees, about eighty or one hundred years old."

"What, in one ship?" exclaimed Dora; "I should not have thought there were enough Oaks in England to supply our navy at that rate; but I remember having read, that when the Spaniards sent out their invincible armada to conquer England, they gave particular orders that the Forest of Dean, in Gloucestershire, should be destroyed; I

suppose it was on account of the Oaks being so valuable to our shipping."

"Yes, it is by that Forest of Dean that our ships are principally supplied, the Oaks there being of the finest sort. But tell me, Fanny, do you think that every part of a ship is built of oak?"

"Yes, I suppose so; is it not?"

"Think again; think of the masts, how very high and straight they are; and then look at the trunks of those Oaks, and tell me if you think one of them would do for a mast?"

"O no, they are all too crooked and too short. I wonder what the masts are made of."

"They are made of the tallest and straightest trees that you know; the Fir-tree, or Pine; which grows best in cold countries, chiefly in Norway, and the northern parts of Europe, from whence we import them in great numbers."

"Is the Oak the largest tree in the world?" asked Fanny.

"No, my love, in warm countries there are many larger; the Monkey Bread-fruit Tree is one of the largest I know of; the usual size of its trunk is one hundred feet in circumference: while (as you remember) the Evethorpe Oak, the largest in England, is only seventy-eight feet."

"Is that the Monkey's Dinner-bell that you were talking of the other day?"

"O no, Dora," said Mary, "that was the Sand-box Tree, whose seed explodes in water."

"I fear you were dreaming, my love, the other day, while I was talking," said Miss Vaughan; "try always to give up your whole attention to the subject before you,

whatever it may be." Then seeing Dora's conscious look, she added kindly, "But I know you are trying to overcome a bad habit, and I do not expect victory all at once. The Monkey Bread-fruit Tree, is a native of Africa; it is called by that name, because the monkey eats away the soft part of the nut while it hangs on the tree, leaving the seed to fall and germinate. The decay of these gigantic trees, proceeding from the centre, is of great use; and their large cavities are employed for a variety of purposes: they make capital houses for the poor negroes, several families of whom often make their habitation together within a single tree. The interior of a great Oak at Altonville, in Normandy, has been converted into a place of worship. An Oak at Redlington has served as the village prison; another at Salsey, is used as a cattle-fold; and many have served as tombs and dwelling-houses. The Sycamore, which is comparatively small in this country, attains in America a prodigious size. I remember hearing a gentleman relate a comical adventure that he met with in one of these trees. He had taken up his quarters for the night, he said, in a celebrated Sycamore in the province of Kentucky, which contained a parlour, kitchen, and stables, where no less than seventeen horses were nightly lodged. Just before retiring to rest in the parlour, which had been appropriated to his use, he was alarmed by the sound of a great commotion in the kitchen. On inquiring the cause, he ascertained that a couple of fugitive lovers from Virginia had made sudden forcible entrance, and were beseeching protection and shelter from the worthy host of the tree. They had heard, they said, of the residence of a priest somewhere in that direction,

and were most anxious to have the ceremony performed as soon as possible. But it was useless to seek him at that hour of the night. Mine host good naturedly received them into his apartment, where they sat up till daybreak; and then departed with them in search of the priest. About an hour afterwards they brought him back to the tree, in which the wedding was immediately solemnized, the host himself giving away the bride in due form."

"Well, I think that is the oddest story I ever heard," cried Mary; "but I cannot understand how such a number of horses could be stabled in a tree. What an enormous size it must have been."

"The size was the same as that of our largest Oak, seventy-eight feet. The horses are small in that country, and were placed in a circle within the tree, leaving the space in the centre to be divided into parlour and kitchen; no doubt both were very small, though quite large enough to serve the purposes of their owner. How wonderful is the variety of Nature's works, placed side by side with one of these proud forest kings! How astonishing would seem the proportions of the Eastern Palm-tree, which is twenty feet in height, and not thicker than a child's finger; or, still more so, those of the miniature trees."

"Miniature trees, Miss Vaughan! I have never heard of them; what are they?"

"I have seen only one," replied Miss Vaughan; "and I thought it the greatest of all the natural wonders I had yet beheld. It had been sent from Scotland in a letter, and was called the *Salix Herbacea*. *Salix* is the Latin term for Willow, the genus or family to which it belongs. It was a

perfect tree, not more than four inches in height; yet the root, trunk, branches, and leaves, were all developed as completely and beautifully as in that Oak before us, and although a species of Willow, I think it rather resembled the Oak in form."

"How I should like to see one! Does it only grow in Scotland?"

"The specimen I saw came from Scotland; but its native home is Persia, where it is found on the summit of the highest mountains. It is also the only tree of Spitzbergen All the Willow family have a partiality for cold. The *Salix Herbacea* is said to grow nearer the Pole than any other woody plant. There is another dwarf tree called the Arctic Bramble, the *Rubus Arcticus*, a native of most of the mountainous and colder regions of Europe; its little stem, which never reaches a greater height than that of six inches, bears three or four leaves, and a single large deep rose-coloured flower; but tiny as this tree is, and apparently insignificant; it is not without its due value in the scale of creation. The flower upon it dies, and is succeeded by a berry, which the Swedish Laplanders esteem not only as a pleasant fruit, but as a valuable medicine. Linnæus, the great naturalist, tells us, that he was once, while in Lapland, seized with a severe illness, in which (humanly speaking) he must have perished, but for the berries of this little tree, which were administered to him by the natives: they restored him without, I believe, the use of any other medicine. There is another diminutive plant of the Bramble genus, the *Rubus Chamæmarus*, or Cloud-berry; it grows in great abundance in the Scotch Highlands, and is gathered

by the inhabitants of those districts in great quantities. They have a very agreeable flavour, and are numerous enough in some places to form a useful article of food. The Scotch call them Roebuck-berries and Knot-berries. This plant is the badge of the clan of Macfarlane. The Chinese and Japanese have long been famous for their method (which is a secret to us) of producing these miniature trees by mechanical means, that is, they make the seeds of trees of the ordinary growth to come up as natural dwarfs. They have liliputian Firs and Palm-trees in blossom; and Bamboo-trees, that in their natural state attain the height of one hundred feet, reduced by this curious process to three or four inches. There is one which you may some day have an opportunity of seeing in the Royal Gardens at Kew; it looks healthy and flourishing at present, but they are, generally speaking, extremely difficult to preserve in this country."

"I would rather find a natural one on the top of a mountain," said Dora.

"Yes, so would I, Dora; knowing that the other is forced and tortured out of its proper growth, takes from the pleasure of looking at it; at least, it is a very different kind of pleasure to that with which we observe a natural production."

"There were some berries in a little bottle in your box, which had something written upon it in Latin; I am almost sure the first word was *Rubus*: are they from one of the miniature trees?" asked Mary.

"Yes, they are the *Rubus Chamæmorus*; the last is rather a long word for your memory. But *Rubus*, you know, is the

name of the Bramble genus. They were sent to me with the *Salix Herbacea*, by a friend who gathered them on the summit of Ben Lawers under the canopy of a cloud. I don't think Dora saw them; did you, Dora?"

"Will you, dear Miss Vaughan, let her look over the box again some day?" said Mary.

"Certainly, my love, if she wishes it; this evening, if there is time, before you go down to dessert."

CHAPTER IX.

O NATURE! all-sufficient over all,
Enrich me with the knowledge of thy works.
THOMSON.

"I SHOULD like very much to study botany in a regular way, Miss Vaughan," said Dora one morning, "if you would not mind the trouble of teaching me, and if you think I can find time for it amidst all my other studies."

"And so should I," said Mary, "very much."

"And I too," added Fanny. "Do let me learn botany, Miss Vaughan: when shall we begin?"

"The principles of botany, I shall be delighted to teach you, dears," replied Miss Vaughan," during our daily walks; something I hope you have already learned; and we shall have time I trust to learn a great deal more."

"I don't quite understand though, what botany is," added Fanny; "is it only learning the names of all the flowers that grow?"

"No, if that were all, it would not be such an interesting and useful study as it is. Botany is derived from a Greek word, meaning 'plant' or 'grass': and the study of botany is the study of plants; that is, of the different parts of which they are composed; their form, their growth and habits: the uses to which they may be applied, as well as the classes and orders to which they belong as well as their names."

"That is a great deal to learn," observed Mary.

"Yes, more than we can ever arrive at a perfect knowledge of. But that is no reason why we should not learn what we can of a study, of which the pleasure is as inexhaustible as the subject. Those who know it the most love it the best; for so far from wearying, every step seems to add to one's happiness. Those who have the love of God implanted in their hearts, will love that which promotes His glory. And what can serve to promote it better than a deeper acquaintance with His wisdom, His skill, and His universal unfailing benevolence. This is the answer I would wish you always to give, when thoughtless people ask you, as they sometimes will, what is the use of your learning botany?"

"Can we learn it without a book?" said Mary. "I think I could learn anything by hearing you talk about it."

"We can begin without very well: but when you have learned the terms for the various organs of a plant, and for the classes and orders, you shall have a book, which we can take out in our rambles, and which will enable you to find out the names of all the flowers you meet with. Then we shall begin to make a collection of wild flowers; for which purpose we must have a knife to dig them up with, a tin box to carry them home in to be examined at leisure, some drying paper to press them in, and a large book full of blank sheets to place them in when dried."

"O what fun it will be! We will ask mamma to-night to get all these things ready for us; I am sure she will, and then we can begin at once."

"But it will be some time, though, before we can begin

collecting; you must first become better acquainted with the organs of plants."

"What are the organs of plants?" inquired Fanny.

"They are the root, stem, leaf, and flower, with its calyx and corolla, stamen, pistils, fruit-seed and receptacle. There are many other minute organs; but it will be sufficient for you at first to be well acquainted with each of these. We will speak of the root first. You all know of course what part of the plant is called the root."

"Yes, the part which is under ground."

"Generally, but not always under ground. What do you suppose is the use of it?"

"To draw the nourishment from the ground, and send it up to the leaves and flowers, I think you told us," replied Mary.

"Yes, by means of the fibres which it puts out; which are so many mouths to suck it up; it serves also to keep the plant steady in its place, by balancing it: if all the weight were above ground, the plant would be top-heavy and fall down. When trees are planted in a situation where they are more exposed on one side than on the other, they always put out roots in such a way as to secure them from the danger: now in which direction is that, do you suppose?"

"Away from the wind, I suppose," said Mary.

"O no, little goose; that would be the way for them to be snapt off, or violently torn up; they always put their roots towards the blast. When a tree grows on the side of a precipice, against which the wind beats with violence, it stretches out its roots far down the steep, taking firm hold of the rock, and wedging its fibres into the

"Then it has more sense than I have," said Fanny; "I should never have thought of turning round to meet the wind to prevent being blown down by it; I should have turned way from it."

"But you should never run away from an enemy, Fanny," replied Mary; "always face him."

"Roots," continued Miss Vaughan, "have been known to take very singular directions, and to run to very great distances, in order to reach a soil favourable to the plant. I have seen the root of a common turnip twenty feet in length, which stopped up a supply of water. They have been known to overturn a wall like the trunk of an elephant. The root of the sacred Banian-tree will overthrow even a solid mass of Indian masonry. This power of roots judiciously applied, might certainly be made extremely useful; and I only wonder that it is not more considered. Sir Sydney Smith gave it as his opinion, that the only method of making a road through the isthmus of Suez, would be by planting trees, whose long roots interlacing each other, and taking hold of the soil, would arrest in their progress those moving particles of sand, the rolling pillars of the desert; and thus consolidating the ground, might form a strong and durable foundation. And I cannot help thinking that many a frightful accident on railroads over marshy ground might have been prevented, had the directors carried out this idea. But I must now tell you that roots have various forms; the most remarkable are fibrous, creeping, spindle-shaped, tuberous and bulbous."

When Dora, Mary and Fanny had each repeated the five terms, Miss Vaughan proceeded.

"A fibrous root is one which is made up of small threads. Pull up that weed, and you will see what I mean: those numerous little strings or fibres, are the organs which draw up the nourishment from the soil. A creeping root is one which runs along under the ground, and sends up stalks at different distances."

"Can you tell us any plant that has a creeping root?" said Mary.

"Many of the Grasses have in dry soils; Horseradish also. The Mangrove-trees, which grow in warm climates, run along the sea-shore, and form thickets quite under water."

"I cannot think what a spindle-shaped root can be," said Fanny.

"Merely a long root shaped like a spindle, such as a Carrot and Parsnip. A tuberous root is one which has large roundish solid knots, which have the power of sending out stems from the surface, as the Potatoe."

"O I know what you mean, I saw the gardener digging up some potatoes the other day, and several of them had long strings hanging about them."

"Yes, those are the rootlets; and if suffered to grow, they would shoot up into plants. We have only one more to learn, the bulbous."

"I know what bulbs are," said Mary; "Hyacinth-roots and Crocuses."

"Yes, but there are three sorts of bulbous roots. The *solid*, which is one uniform mass like the Crocus; the *coated*, which is composed of circles, one within another, as the Onion; and the *scaly*, which is made up of fleshy scales, like the Lily. These bulbs and tubers, with which so many

plants are provided, are of the greatest use as a sort of shelter to them, during the time of year that is unfit for vegetation. Just as the caterpillar retires into its shell when its sunny day is over, so plants at the approach of winter, take shelter in their bulbs, where they are nourished and preserved alive through the frost and snow, until the return of spring."

"Then, I suppose," observed Dora, "that in countries where there is no winter, plants are not furnished with bulbous roots?"

"Yes, Dora, they are, because they are equally necessary there. Extreme heat without moisture, is as unfit for the growth of plants as extreme cold; and has a similar effect. During the dry season in tropical countries, especially in Southern Africa, where it is hottest, vegetation on the surface of the ground completely disappears; and the plants take refuge in their bulbs."

"And what do the plants do there which have no bulbs?"

"Wither away as ours do, when their seed is scattered: but in those countries there are few plants which are not either bulbous or succulent."

"What is succulent?"

"Succulent plants have neither stem nor leaves; only a thick fleshy substance full of juice, which is defended from the heat by a very tough skin; and resists it in the same manner as the bulbs. Roots are divided again into three kinds; annual, biennial and perennial; you know, of course, that an annual is one that dies away by the end of the year, and is propagated by seed only."

"Yes; but we don't know what a biennial is, unless it

means one that lasts two years," said Mary, "just as a biped means a two-footed animal."

"*Bi* signifies two in both cases. In the case of the plant it implies two summers; in the first summer it produces leaves, and in the second flowers; then it dies, having lived but little more than one year. Perennial roots are those which live from year to year, to an indefinite time. All woody plants have perennial roots, and some herbaceous ones also; but the greatest number of the latter have annual or biennial roots."

"I don't think I quite understand what an herbaceous plant is," said Mary.

"They are those which are not woody, that is, all which are neither trees nor shrubs. Now we have done with the subject of roots. I don't, of course, mean that I have told you everything that is to be learned respecting them, but merely enough for you to bear in mind at present. Our next lesson will be on stems. But we must all help little Fanny now to fill her flower-basket before we return home: but I should like you first to repeat to me the substance of what I have been trying to teach you to-day, and to show me specimens, if you can, of the various kinds of roots we have been speaking of."

This was soon accomplished, for the girls were beginning to acquire a habit of attention, as well as of observation, and seldom now forgot any part of the instructive conversation in their daily walks, which had become so interesting that any interruption to them was regarded as a special calamity, and no one was ever heard to sigh for a wet day.

CHAPTER X.

LOVE had he found in huts where poor men lie;
His daily teachers had been woods and rills;
The silence that is in the starry sky,
The sleep that is among the lonely hills.

WORDSWORTH.

"NOW we are all attention, dear Miss Vaughan, for the second botanical lecture. *Stems* is the subject for this evening. I don't really think you can find much to tell us about that, however; the stem of a plant can only be the long straight thing that runs up from the root for the leaves and flowers to grow upon."

"Not always a long straight thing, Mary," replied Miss Vaughan; "a stem has many different forms: those which I shall point out to you now as the principal, are the simple, the compound, erect, ascending, prostrate, creeping, climbing, twisting, and branched. A stem is said to be simple when it bears leaves and flowers without branches."

"Then have not all herbaceous plants simple stems?"

"O no; let us examine some of these in the hedge: you will find most of them branched. That tall daisy has a simple stem; but look at this *Myosotis Versicolor*. Soon after the stem leaves the root, you see it is divided into two; and, farther up, it is divided into two more; a stem of this kind is called forked. And here is the *Hypericum*, or St. John's Wort, where it is equally divided into three.

Sometimes they are much more irregularly branched, as in Flax-seed, which grows on damp heaths."

"I do not think," said Dora, "that I ever saw this *Myosotis* before. How curious it is; there are blue and yellow flowers growing on the same plant."

"Yes; it is from that circumstance it takes its name, *Versicoloris* (party-coloured). See how singularly the flowers are coiled up when in bud."

"I understand the difference between a single and a compound stem, now," said Mary. "A dandelion and a primrose have simple stems, and all grasses, I should think."

"Yes; but the particular term for the stalk of grasses is culm, or straw. An erect stem is one which stands straight up like that nettle. An ascending stem is one which runs along the ground when it first leaves the root, and then becomes erect. Try and find me a stem growing in that way. Dora is right, I see her examining a Mallow."—When Mary and Fanny had convinced themselves that the Mallow had an ascending stem, Miss Vaughan continued—"A prostrate stem continues to run along the ground without ever becoming erect. They are very troublesome weeds to the gardener. The *Pearl-wort* is one of them."

"And is not a creeping stem the same thing?"

"No; it has this difference; it sends out roots from its joints. Can you think of a plant bearing a pleasant fruit that has this habit?"

"The Strawberry," exclaimed Mary and Dora in a breath.

"Yes; a stem is said to be climbing when it mounts up by means of tendrils as in the Vine and Pea; or by means

of fibres, as those by which the Ivy adheres to a rock, or wall, or a tree. Twisting, when it coils itself round a stick, a tree, or any other plant like the Honeysuckle and French Beans. Branched, as in trees and shrubs. Now, repeat to me again the terms for the different forms or habits of stems; and then I will tell you something of the composition of a stem." They did so; and Miss Vaughan continued. "The stems of woody plants which, in the large ones, are called trunks, are made up of four distinct parts: they are, the pith, the wood, the bark, and the epidermis. The pith is in the very centre; it is most abundant in young trees. In old hollow ones it is not found at all. Then comes the wood, which generally forms a new ring every year. Then the bark, which covers the wood, and receives also yearly additions; and outside all, the epidermis, a thin skin which is always found round young trees, but not in any old ones. The last formed wood is called Alburnum, or Sap-wood, it is softer than the old, because more full of sap; the last formed bark, or liber, is also the softest."

"I remember," said Mary, "your showing me a piece of paper, that was made of the inner bark of the Mulberry Tree. I wondered, then, what inner bark meant; now I understand."

"Yes; the bark of trees has been often manufactured into paper. Now we may proceed to leaves. You remember, I dare say, what I told you some time ago respecting the use of leaves."

"Oh, yes; it was the day we gathered the first primrose. I know what their use is: they absorb and give out gas; and the plant breathes through them, as we do through our

lungs: they prepare the sap too, and make it fit for the nourishment of the plant."

"Very well, Dora; the gas that they give out is oxygen, the most necessary to the support of animal life, and which is inhaled by us every time we breathe. That which they inhale is carbonic acid, a gas which is destructive to animal life, and which we exhale every minute. So you see in what a wonderful way the animal and vegetable world support each other. We could not exist without them, nor they without us."

"Yet I have heard people remark," said Dora, "that it is very unwholesome to keep plants in a bed-room; I cannot understand that now, I should think it must be quite the contrary."

"It *is* unwholesome for this reason, in the night they give out carbonic acid gas, and retain the oxygen in their leaves. This is owing to the absence of light, which is so necessary an agent in preparing the sap."

"I remember another use of leaves, Miss Vaughan," said Mary; "when they decay, they form a very good manure for the ground, and many insects and small animals feed on them in winter."

"Yes; and, Mary, in some countries where leaves grow very large, people use them as covering for their houses, and for various household purposes.

"The Lotus from Berbice, the Victoria Regia, I suppose is one of them."

"No, not the Lotus; aquatic leaves are of no use; when removed from their native element, they soon wither, because they are not furnished with the organs for retaining

moisture, which other plants possess; growing in water, of course they have no need of them. But the leaves of the Banana and Plantain Tree, as well as the Palmetto, are frequently made use of for such purposes; the varieties in the forms of leaves are very numerous. The first divisions are the simple and compound; a simple leaf consists of one piece as in the Ivy or the Nettle; and a compound leaf consists of two or more leaflets on a common stalk, as in Clover, Jessamin, etc.; the leaves which spring directly from the root, as in the Dandelion, are called radical. Gather that piece of Nightshade and you will see what are called alternate leaves, one springing above the other. Sometimes they are opposite, as in the Pink; and again in our friend the Nettle. You know the plant called Goose-grass or Cleaver; look for it, and I shall be able to shew you what whorled leaves are."

"Is it not a rough, sticky plant, Miss Vaughan?"

"Yes; Mary has found a specimen. These leaves are said to grow in whorls or circles round the stem. Woodruff is another example, the leaves of which, when dried, smell like new-mown hay. I always keep a supply of them in my drawers and boxes, and I find them retain sweet scent for years. They are said, also, to be an excellent preservative against moth."

"How I should like to find some."

"We will look in the wood next the park as we return home; but I doubt whether we shall be able to find it so late in the summer. It is an annual, and its time of flowering about June."

"And what are the other forms of leaves, Miss Vaughan? for I suppose we have not learned all."

"No; there is a long list yet; but we shall get on by degrees, if you remember them as you go on. A simple leaf (or a leaf which consists of one piece) is sometimes cut or lobed. Gather a bit of that Mallow, and count the lobes; you will find them to be seven: it is a seven-lobed leaf, but still simple, because the centre consists of one piece. Sometimes these lobes are more deeply cut, as in the Vine and some kinds of Geranium. Sometimes they are cut nearly to the stalk, and the lobes very narrow; then they are called *palmate*, from *palma*, the palm of the hand, the lobes being supposed to look like fingers. Sometimes the stalk passes through a simple leaf; then it is called *perfoliate*. And sometimes the leaves are without stalks, growing close to the stem; they are then called *sessile*, or sitting, because they sit on the stem. Sometimes a number of leaflets, or small leaves, are ranged on each side of one stalk, as in that little weed growing among the grass under your feet, the Silver-weed, or *Potentilla*. Such leaves are termed *pinnate*, from *pinna*, a feather. The Rose and the Jessamin have also pinnate leaves. Can you tell me, now, whether pinnate leaves are simple or compound?"

"O compound, certainly, because they are not all in one piece."

"Very well; the other terms are easy to remember, because they express the meaning. Heart-shaped, as in the Hazel-nut; kidney-shaped, as in Ground-ivy; arrow-shaped, as in Bindweed; egg-shaped, or oval, as in the Pear; angular, as in Ivy; linear, or line-like, as in all the grasses; hair-like, or capillary, as in Fennel. Now you may amuse yourselves by gathering as many specimens as you like, and then describing them to me."

'Well, little Fanny, and how many varieties of leaves and stems and roots have you to shew me?" *Page* 85.

Away ran the girls, and they were some little time gone, for Dora suggested to her sisters that Miss Vaughan looked tired (as she often did after talking a long while), and that it might rest her to walk slowly on by herself a little way, while they were amusing themselves.

Miss Vaughan heard their cheerful voices at a distance, and she felt happy to think how they were improving under her care, and how different was their manner now to the listless unsatisfied expression they generally wore when first she came among them. Presently she called them to her, and they came running with their hands full of specimens.

"Well, little Fanny, and how many varieties of leaves, and stems, and roots, have you to show me?"

"You shall see, Miss Vaughan. First of all, here is my favourite Forget-me-not. I know it is the true one, because I found it close to a stream, and it has long leaves and bright blue flowers, with five petals; well, it has a creeping root, a forked stem, and oblong leaves, which are both simple and entire. And this Convolvulus has a twisting stem, arrow-shaped leaves, and, I suppose, a creeping root; but it was so firmly fixed in the ground, that I could not pull it all out."

"Very well remembered, darling. Now let us examine Dora's."

"I said them over to Dora first," added Fanny, "and she explained to me again what you had been saying; I did not remember it all myself."

Miss Vaughan's approving smile, as she kissed Fanny's glowing cheek, rewarded her for this little confession.

"I cannot tell what this plant is," said Dora, "though it

is a very common one, and I could not get it up by the root; but it has an erect stem, and leaves which I suppose are pinnate, but they are not like those of the Rose or Jessamin."

"Its name," replied Miss Vaughan, "is Milfoil, or common Yarrow. When the leaflets of a pinnate leaf are cut in this way, they are called *pinnatised*, which signifies a feather divided. I have heard it called by the old English name of Nose-bleed, and I dare say it was once thought to possess the power of stopping blood. You know in former times, these weeds, as you disdainfully call them, were almost the only known medicines."

"Now it is my turn," said Mary, "for we are just at home. Here is a curious kind of Buttercup, Miss Vaughan; it has a creeping root, a creeping stem, and leaves which are, I think, pinnate."

"No, Mary, there are three leaflets on a common stalk: when that is the case, they are called ternate; when there are five leaflets, they are quinate; and when more than five, pinnate."

"And when there are four, what is it called?"

"I do not think you will find four on any plant; there is always one at the top, and an equal number ranged on each side. Your plant is called the Creeping Buttercup, or *Ranunculus Repens;* beneath every leaf on the lower stem it sends out a little shoot, which takes root in the ground, and makes it a troublesome weed: it only grows in moist places."

"Yes; I found it close to the stream. And now just look at this, if you please, and tell me whether the leaf is

not capillary, hair like; the flower is something like a daisy."

"Yes; it is the *Corn Fever-few*, another flower whose English name expresses its supposed medicinal use, that of allaying fever. Now we must hasten in and prepare for tea, for our botanical ramble of to-day has rather exceeded its allotted limits."

CHAPTER XI.

Go mark the matchless workings of the Power,
That shuts within the seed the future flower;
Bids these in elegance of form excel,
In colour these, and these delight the smell;
Sends Nature forth, the daughter of the skies,
To dance on earth, and charm all human eyes.

COWPER.

"TO-DAY, then, we are to commence the wide subject of flowers," said Miss Vaughan, as they sallied forth on the following afternoon.

"I begin to fear that it is a very wide subject indeed," replied Dora, "almost an impossible one for us. The variety among wild flowers alone appears so infinite, that I cannot see how we are ever to remember all their different peculiarities, so as to recognise them at first sight, and to know their names."

"Fortunately that is not necessary, my love; the variety is very great, but not *infinite*. The number of British plants has been ascertained exactly, and the whole species classified and arranged in such a manner as to disarm the study of botany of more than half its old terrors; for it used to be indeed a most intricate science. Certain peculiarities, easily learned, mark the tribe and class to which a plant belongs; in your book you will find a description of all the plants belonging to that tribe; compare your flower with them, and you cannot fail to discover

its species and name. I do not, however, wish to persuade you that botany is an easy science; I have often told you on the contrary, that it is in its perfect sense more vast than you can ever hope to master. I have no idea of making you learned botanists, I should not have time even if I had ability; I only wish by shewing you the outline of this grand study, to give you a taste which you may hereafter improve, and which will be a blessing to you in your future life, by providing something for your mind to fall back upon in quiet moments, amidst the cares and business, or the fatiguing pleasures of the world. In short, if it may be to you what it has been and still is to me, my endeavour will be fulfilled. But we have not yet done with that rather dry part of the subject, the organs of plants. You are now going to hear about those of the Inflorescence, which is the term used in botany for that which you call the flower, and which is, in fact, that part of the plant which is preparatory to the perfecting of the seed. I dare say Fanny thought that the beautiful formation of every flower was merely meant to please her eye; she did not consider that the purpose of each little organ within it was to form, and preserve, and ripen, and then to shed the precious seed! but so it is. In the flower, or inflorescence, there are seven distinct parts. The first is the calyx, or flower-cup. This is outside all the rest; it is almost always green, and divided into several leaves which are called sepals. Gather that Mallow and you will find it."

" O yes, I see it plainly, replied Dora; " this green cup outside." There is a calyx to every flower, I suppose?"

" No, it is sometimes wanting, and sometimes it falls off

when the flower expands. Next comes the corolla, that delicate and most beautiful part, which to unobserving eyes appears to be the flower itself. It is generally divided into leaves, which are called petals, and falls off when the preparation for the seed is finished. Then the stamens, a ring of thread-like substance within the corolla. On the point of each stamen we generally find a little knob, called the anther; which is a sort of box filled with fine dust, called pollen. It is this dust which gives scent to the flower. The lower part of the stamen is termed the filament. The fourth part is the pistil, placed in the very centre of the flower, and surrounded by the stamens; the top of the pistil is called the stigma, and that which supports the stigma is the style, just as the filaments of the stamens support the anthers. The lowest end is termed the germ, and it is that which contains the elements of the future seed. It is also called the ovary, from *ovum*, an egg; which is, I think, a better name; for the seed of a plant may well be compared to the egg of an animal. Most flowers contain only one pistil, but some have two or more. There must be stamens and pistils belonging to every flower, for they are the organs which produce seed; and neither could produce seed alone; but they are sometimes found in different flowers of the same plant, and sometimes even on different plants."

"But how can that be if they are both wanted to produce seed? the flowers cannot act with each other upon different plants."

"Yes, Dora, they do; what is required is, that the pollen within the anthers should be conveyed to the stigma upon

the pistil, and this purpose is effected by the wind, which carries it on its breath from one to the other."

"How wonderful that seems!"

"The fifth part is the *pericarpium*, or seed-vessel, in which most, but not all, seeds are enclosed; when they have no seed vessels, they are called naked seeds. The sixth is the *receptacle*, or that which receives all the other parts of the flower, and unites them."

"Then is not that the same thing as the calyx?"

"No, Mary, the calyx is outside all, the receptacle is inside of the base, or bottom of the flower. In some it is not easily discerned; in others it is very distinct. You have eaten artichokes, and you know the part which remains when you have pulled off all the leaves, and which you call the meat: that is the receptacle. Pick off the corolla from this daisy, and you will see a little green thing rising from the base in the shape of a cone: that is it also. The seventh and last part is the seed, or fruit, which is formed within the ovary. As soon as the pollen has been absorbed by the pistil, the ovary enlarges, and the stamens, pistil, and corolla, having performed their various offices, wither; fall away to make room for the seed-bud, which becomes larger every day until it reaches its perfect state. There is another part called the nectary, which is found in some, but not all flowers. It is a little cup concealed generally under the petals, which contains a small quantity of honey-like juice. Its use to us is well known; its use to the plant appears to be that of a reservoir for the nourishment of the young seed."

"Then bees cannot gather honey from all flowers?"

"No; instinct guides them to those in which the nectary exists. We will pass through the flower-garden in returning to the house, and there I shall be able to shew it to you in several flowers. In the Nasturtium and Columbine it is very plain; in the form of a spur at the bottom of the corolla. In the crown imperial it is a little hole underneath the petals, from the ends of which, as the flower hangs down, you may see the honey-juice dropping."

"And from what part of the flower do the bees make wax, Miss Vaughan?"

"From the pollen, Fanny, or farina, with which the anthers on the stamens are filled."

"But the flowers want that to make their seeds."

"There is enough provided for flowers and bees, and a number of other insects into the bargain. Just consider how many seeds are produced from a single flower and what would be the consequence if all these were to germinate. No less than 32,000 have been counted in one Poppy, and 360,000 in the blossom of a Tobacco-plant. There can be no doubt that this redundancy is designed expressly to support a portion of the animal world; otherwise one single species would shortly be enough to overrun the whole globe."

"Ah, I never thought of that before; but have we done with the organs now?"

"Not quite, I must tell you what the different varieties of the seed-vessel are called. The first is a *capsule*, or little box, as in the Poppy; the second, a *pod*, as in the Pea and Bean; the third, a *berry*, as in the Gooseberry and Currant; the fourth, *Drupa*, as in the Plum and all stone fruits; the

fifth, *Pome,* as in the Apple and Pear; the sixth, the *cone,* as in the Fir and Pine; the seventh, a *nut,* as in the Hazel, etc. . And now I think you are sufficiently acquainted with the principal parts of a plant to be able to understand the botanical descriptions which you will find in your book; so we will proceed at once to the classification of plants, which consists in forming them into classes, orders, genera, species and varieties. All the known vegetables upon the face of the earth have been arranged under these divisions. Classes are the first division. I dare say you have not forgotten the names of the three grand classes, into which, as I told you the other day, the whole vegetable kingdom is divided."

" Let me say them, Dora," said Mary. " These are *Dicotyledons*, *Monocotyledons* and *Acotyledons*. To the first belong all plants whose seeds have two lobes or *Cotyledons*; to the second, those which have one lobe only; and to the third, the flowerless plants, which we have learned nothing at all about yet."

" Very well, Mary; remember that the first class are also called *Exogens,* which means growing from the outside, because the stems of these plants increase in thickness by the formation of new substance between the wood and the bark; and the second, *Endogens*, which means growing from the centre. Plants of that kind increase only in length, and have the outer part of the stem the oldest. All the plants that are formed into one class, must have at least one character or habit in common; and which does not belong to plants of any other class. All those which are formed into the same order, must have at least two common

properties. Orders are divided again into genera, or families, which must have at least three common properties. Genera into species, which have all their particular qualities alike; and species into varieties, in which the differences are merely accidental, or such as are not natural to the plant, but seem to be owing to change in situation or culture, such as an unusual colour of the flower, or form of the leaf. You must understand that the difference in species is a natural difference, and that it is impossible for any one to change one species to another by art. The changes in varieties, on the contrary, are generally produced by art. A flower which is naturally white, may be made by art to come up blue, or pink, or almost any colour; but it is still just the same species of plant as the white one. It is only a variety of the species."

"Then," said Dora, "I suppose the chief thing to be acquired in botany, is a knowledge of the species?"

"Exactly so; it is the most important part of the subject. Perhaps it will help you to understand the classification, if you think of *class* as the name of a division of the world containing many countries, as Europe, for instance; of *orders*, as names for the various races comprising the nation, such as the English and French; of *genera*, as names for the several families included in a race; of *species*, as individual names for the brothers and sisters in each family; and of *varieties* as terms to describe them, to inform us whether they are tall, or short, or dark, or fair."

"Ah! I think I understand it now," cried Mary; and Fanny's eyes brightened at the same moment, as if with the thought that even she might be able at length to comprehend the mysteries of botany.

"And how many species of plants are there, Miss Vaughan?" inquired Dora.

"There are about 30,000 species, and of course endless varieties, as the latter are liable to change. But I must now tell you, that there is more than one kind of classification; that is, there are natural and artificial systems."

"What can that mean?" said Mary, with a look of alarm; "what is a natural system?"

"A natural system is one in which the plants that are assembled under the same head, are similar in habits, manner of growth, properties and uses. An artificial system is one in which the arrangement is founded upon some single part of the plant, a knowledge which is *not* a key to its general qualities; that is to say, that the plants classed under one head, may differ in all respects but one, and that one, such as only an acquaintance with the system can help you to discover. That of Linnæus, which is the best of the artificial systems, because the simplest, and the one now generally established, is founded entirely upon the stamens and pistils of the flower. These he calls the essential parts, because they are the parts on which the formation of the seed depends."

"But plants are not always in flower, and how can you find them out when they are not?"

"You cannot at all by his system, which is a disadvantage to it; nor does it give you any information respecting the plant. Its best use is that of a key to the natural one; as such no doubt he intended it, and as such only I shall endeavour to teach it to you. The natural system must be your ultimate object; and although difficult, I am sure that you will find it by far the most interesting."

"Then to which system does the arrangement belong that you were explaining to us just now?"

"To the natural one, generally adopted in Britain. To-morrow I will endeavour to explain to you the Linnæan system; but we must talk upon some other subjects now, for you have had enough of botany for one day. Little Fanny has been very patient and attentive, and we must reward her by helping to arrange that fine nosegay for mamma, which is threatening to tumble to pieces. Let us sit down a little while under the shade of that magnificent Oak yonder."

CHAPTER XII.

'Tis born with all; the love of Nature's works
Is an ingredient in the compound man,
Infused at the creation of the kind.
And though the Almighty Maker has throughout
Discriminated each from each, by strokes
And touches of His hand, with so much art
Diversified, that two were never found
Twins at all points, yet this obtains in all,
That all discern a beauty in His works,
And all can taste them. COWPER.

"HERE is a fine evening for the Linnæan system, Miss Vaughan; is it not? But I should like first to know something of Mr. Linnæus himself; will you give us a little account of his history. He was a Swede I know, to begin with."

"Right, Mary. His father, who was a country clergyman, lived in a spot of romantic beauty; and being also something of a botanist, the taste of his famous son was early directed towards natural objects. In his own words, Linnæus was transferred from his cradle to a garden."

"I suppose he was a very talented child."

"Quite the contrary; he gave no promise at all in his young days of the eminence he attained in after life. His father found him a dull scholar, even in botany; and his tutors pronounced him, at the age of nineteen, if not a positive blockhead, yet at all events unfit for the profession of the

Church, for which they had been vainly trying to prepare him, and recommended his being apprenticed to some trade. After all, however, he was brought up as a physician, and to this profession he devoted himself for a livelihood; but his mind was ever earnestly fixed upon the study of Nature, and upon botany in particular. To this he clung through poverty, misery, and sickness, for he had a great deal to suffer. Eight pounds a year was all his father could afford to allow him, and with this sum he set out in the world. Of course, it was not enough to satisfy his wants; and when his practice failed him, he had to endure all sorts of privations. It is said that he used even to mend his own shoes with folds of paper, and at one period he was in such distress as to be often at a loss for a meal. A kind friend, however, came to his aid. Rudbeck, the old professor of botany at Upsal, hearing of his miserable situation, engaged him as tutor to his children, received him into his house, and assisted him to prosecute his botanical labours. Afterwards he undertook his celebrated journey to Lapland, travelling alone, on horseback and on foot, over 4,000 miles. On his return, he published a description of this journey in an excellent work, entitled 'Flora Lapponica.' It has been lately translated into English."

"Was it in that book you read his account of the miniature Willow-tree, whose berries cured him in a sickness?" enquired Mary.

"Yes; and a most interesting book it is. He wrote a great number of books on botany, at the same time that he was practising physic, and delivering lectures on mineralogy and other branches of natural science."

"How absurd it was of those tutors to call him a block-head!" said Dora.

"Genius does not always show itself in early years; but the success of Linnæus appears to have been chiefly owing to his extraordinary perseverance and the energy of his character. I do not mean to say that he was not also possessed of great powers of mind; but they alone would not have sufficed him, without these other qualities, to work out his clear and simple system from the barbarous, confused writings by which he was surrounded. The patience with which he laboured night and day was even more wonderful than the rapidity with which he accomplished his great task."

"Did he ever visit England?"

"Yes; but he was disappointed with the collections of natural history that he found here, and was ill received, I am sorry to add, by the professors, who were, doubtless, jealous of his innovations. Even from his own country he met with little gratitude during his life; but on the occasion of his death there appeared to be a change in public feeling, for a general mourning took place, and Gustavus III. mentioned the event in a speech from the throne as a national calamity, and also ordered a medal to be struck, expressing the public loss."

"It seems," said Dora, "to be the usual fate of great men, to struggle through life with poverty, misery, and privation, and then to receive useless, empty honours when they can no longer want them, or be conscious of them."

"It is, indeed, too often so," Dora. Those who labour for the sake of a personal reward will very seldom find it in this

world, except, indeed, in the peace of their own consciences (if it be a noble labour), and the remembrance on a death-bed of a useful, well-spent life."

"And what was poor Linnæus' system?". said Mary, after a pause. "How does it begin?"

"The Linnæan system, which, as I told you, depends entirely upon the stamens and pistils of flowers, begins with dividing all known vegetables into twenty-four classes, the names of which are derived from the Greek. The first twelve are merely the names of numbers, with the addition of the word *andria,* which means fertilisers, or the stamens; the other twelve depend upon the arrangement of the stamens—

Classes.	
1. MONANDRIA .	one stamen.
2. DIANDRIA . .	two stamens.
3. TRIANDRIA . .	three stamens.
4. TETRANDRIA .	four stamens.
5. PENTRANDRIA .	five stamens.
6. HEXANDRIA .	six stamens.
7. HEPTANDRIA .	seven stamens.
8. OCTANDRIA .	eight stamens.
9. ENNEANDRIA .	nine stamens.
10. DECANDRIA .	ten stamens.
11. DODECANDRIA. .	twelve to nineteen stamens.
12. ICOSANDRIA .	twenty or more on the calyx.
13. POLYANDRIA .	twenty or more on the receptacle.
14. DIDYNAMIA .	four, two longer than the others.
15. TETRADYNAMIA .	six, four long and two short.
16. MONADELPHIA .	stamens united by their filaments in one set.
17. DIADELPHIA .	united in two sets.
18. POLYADELPHIA .	united in three or more sets.
19. SYGENESIA .	stamens united by their anthers.

Classes.	
20. GYNANDRIA .	stamens inserted on the pistil.
21. MONŒCIA .	stamens and pistils in different flowers, but on the same plant.
22. DIŒCIA .	stamens and pistils on different plants.
23. POLYGAMIA .	flowers of three kinds, some with stamens only, some pistils only, and some with stamens and pistils.
24. CRYPTOGAMIA .	flowers invisible, uncertain whether they have any.

Dora and Mary then repeated over the names of the classes several times, until they thought they knew them; and Dora observed, "that the last appeared to correspond with the third natural class, *Acotyledons*, comprehending the Ferns, Mosses, Fungi, etc."

"It does exactly," replied Miss Vaughan; "and its name signifies concealed union."

"And what part do the pistils act?" enquired Mary.

"They form the orders into which each class is divided again: the first thirteen orders depend entirely upon the number of the pistils. You may easily remember them, for you have only to change the word *andria* into *gynia*, which denotes pistils—

MONOGYNIA . . .	one pistil.
DIGYNIA	two pistils.
TRIGYNIA	three pistils.
TETRAGYNIA . . .	four pistils.
PENTAGYNIA . . .	five pistils.
HEXAGYNIA . . .	six pistils.
HEPTAGYNIA . . .	seven pistils.
DECAGYNIA . . .	ten pistils.
DODECAGYNIA . . .	twelve pistils.
POLYGYNIA . . .	many pistils.

I shall not tell you yet how the orders are determined beyond the thirteenth class, for fear of perplexing you; you will learn them as we go on. We will now gather a few flowers and dissect them, to see whether we can find out to what class and order they belong. Beside that muddy ditch we are very likely to find the Mare's-tail, or *Hippuris*: here it is. The flower is very minute; but with the help of a glass you would be able to discover that it has neither calyx nor corolla, and only one pistil and one stamen, which place it in the first order of the first class; but it is not in blossom now."

"Here is one, however, in full bloom."

"The Water Star-wort. Try, now, to find out to what class it belongs."

"It has one stamen only," replied Dora, "so it must belong to the first class, *Monandria*; and two pistils, therefore it must belong to the second order, *Digynia*."

"Well done! Now, Mary, can you tell me about this *Veronica?*"

Mary examined the flower, and presently announced that it had two stamens and one pistil, and that, consequently, it must belong to the second class, *Diandria*, and the first order, *Monogynia*. "But," added she, "how does this enable us to find out the names of flowers that we meet with for the first time?"

"By referring you to a book in which you find a list and description of the flowers under each division. To-morrow you shall have the one I promised you, and it will give you a clearer idea of the subject."

CHAPTER XIII.

THE earth was made so various, that the mind
Of desultory man, studious of change,
And pleased with novelty, might be indulged.
COWPER.

As soon as lessons were finished on the following morning, the promised book was produced, to the great delight of our young botanists. It was a simple arrangement of British flowers,* in which the Linnæan system was made (as Miss Vaughan had described it) a key to the natural.

"You see," said she, "that the genera and species are arranged in their natural orders and tribes, these tribes being known by certain characteristics, which you will find explained as you go on. When you wish to find out the name of a flower, you must first of all ascertain its tribe, and under that head you will find a description of all the genera and species belonging to it; by comparing your plant with them, you will easily see to which it corresponds. But if you are at a loss to know the tribe, you have only to find out its Linnæan class and order, by examining the stamens and pistils, and under those which are given at the beginning of the book, you will discover what tribes are included in each; but this you will comprehend better by practice. Now run and get ready for a walk, and we shall see what use we can make of our new book."

* "Flowers of the Field," by the Rev. C. A. Johns.

Furnished with a knife and basket, the happy party set off in more than ordinary spirits.

Mary was the first to fix upon a subject to botanise. "I have so often seen this flower," she said, "that I should like to know what it is. I have dissected one of the blossoms, and find that it has two stamens and one pistil, therefore it belongs to class *Diandria*, and order *Monogynia*. I see there are seven tribes placed under that head. I think this must be the *Labiate*, because that says, square stems and opposite leaves: am I right?"

"Yes; you have found the tribe. *Labiate* signifies two-lipped; and you will find that all the plants in this tribe have a lipped or gaping corolla, as well as square stems, which make it a very easy one to distinguish. Now turn to the *Labiate* tribe, and let us see whether we can find out the species. How do you describe your plant?"

"Let me see. It is rather a tall plant, with an erect stem, which is bushy and covered with white down; the leaves are opposite, sessile, egg-shaped, and serrate; it has white flowers, which grow in whorls."

"Are the leaves wrinkled?"

"Yes."

"Then your plant answers to the description of *Marrubium* (White Horehound)."

"O yes; that is it exactly," cried Mary in great glee, reading the description. "This shall be my first flower to-day;" and placing it safely in the box, she set off with increased zeal to search for more.

"This must also belong to the *Labiate* tribe," said Dora, holding up a tall branched plant, with longer leaves than

the preceding one, "for it has a square stem. I thought at first it was the same as Mary's, but I see that the flowers grow differently, the whorls are closer, and clustered together on the top of the stem; they are white, also, but dotted with red. The under part of the leaf is white, and the stem is covered with down; the leaves are heart-shaped, tapering to a point. Ah! I have found it. I am sure it is the *Nepeta*, or Cat-mint, so called from its aromatic scent, which cats are fond of."

"You are quite right, Dora. I think now you perfectly understand the *Labiate* tribe."

"O Miss Vaughan!" exclaimed Fanny, "I have found a square-stemmed plant; is this *Labiate*, too? I was afraid of it at first, it looked so like a Sting-nettle; but I find it does not sting at all."

"Well done, my little girl, you have found the *Lamium Purpureum*, or Purple Dead Nettle. Now look for its brother *Lamium*, the White Dead Nettle, which is still more like the Sting-nettle in appearance, though quite harmless. I saw Dora draw away her hand from one just now in a great fright, thinking she was stung."

"Is it a Nettle with a white flower?" said Fanny, "I think I see something like it in the hedge there."

"That is it. Now, Dora, take courage and gather it for us. I pledge you my word that you shall not suffer much, even without your glove."

Half nervously, Dora grasped the stem and picked it; and then finding she had really come off unhurt, rubbed it playfully over Fanny's face, who shouted with joy at her discovery, as she called it.

"How many flowers there seem to be of this tribe," said Dora.

"Yes; most of the autumnal wild flowers belong to it, but not all. Let us cross this Turnip field, I dare say we shall find many flowers, without straying far from the path. Ah! here is the *Scandix Pecten* (Shepherd's Needle), so called from its peculiar clustering seed vessels, which taper to a point almost as sharp as that of a needle. The flower is very small; but by the aid of our glass, I think we may discover its class and order."

"I see," replied Dora, "five stamens and two pistils. Look in the book, Mary, for the fifth class and second order."

"The first tribe mentioned," answered Mary, "is *Umbelliferous*; the flowers grow in small umbels. What does that mean, Miss Vaughan?"

"Turn to the introduction, and you will see that the umbel is a mode of infloresence in which the flower stalks spring from a common centre, and bear each a single flower, as in Ivy, for instance. Turn the flower downwards, and you will perceive that the stalks are united at the stem, and spring outwards round it, just like the spokes of an umbrella, which are united on the stick. When several of these small umbels proceed in like manner from a common stalk, it is said to be a compound umbel."

"It is a pretty innocent-looking little plant," said Fanny; "but I should never have spied it out myself, I think. How finely cut the leaves are, and what a bright green! *Umbelliferous* tribe, I shall always remember that, because it sounds like umbrella; and it *is* like an umbrella, too."

"Well, now let me see who will be the first to find another of the said tribe; run, Fanny."

Away ran all three, and commenced a diligent search, which ended in all three screaming out at the same moment that they had gained the prize. Mary was the first to overtake Miss Vaughan, who pronounced her plant to be the *Daucus*, or wild Carrot. It was a bristly plant, with deeply lobed serrate leaves, and large umbels, of dull white flowers, and in the centre a deep red spot. Dora had gathered her flower in the hedge. She thought it curious, because it had two different sorts of leaves, a circumstance that she had never remarked in a plant before, the lower ones being pinnate and saw-edged, and the upper ones twice pinnate; that is, the leaflets were divided again into leaflets, narrow and sharp, with edges entire.

"It is the *Pimpernella Saxifraga*, or Common Burnet," replied Miss Vaughan. "That kind of peculiarity about the leaves is common to many plants. I remember, however, that the first time I observed it, I thought, like you, that I had discovered something very singular. My prize was the *Ranunculus Aquatilis*; I found a great quantity of it in one part of a small stream. Numbers of very pretty white flowers, with flat round leaves, lay floating on the water; and when I drew some of it up to examine, I found other leaves, on the same stem, under the water, of quite a different form—they were what is called capillary, or hair-like, very finely cut, like Parsley. The design of this difference did not occur to me then, for I was too young to reflect much about it; but I have since found it out. The leaves which grow above the water are broad and flat, that

they may receive nourishment from the air, to which they are exposed, for the support of the plant; but if those which grow under the water were broad and flat also, they would soon be snapped off by the force of the stream; while being divided in this way, they yield easily to the water, and remain uninjured, just as in a violent hurricane large powerful trees are torn up suddenly by their roots, while the delicate sapling bows its head, and the storm passes over it harmlessly."

"If we turn into the lane at the other end of this field we shall come to a stream. Do you think we might find this *Ranunculus* there?" asked Mary.

"I fear not, my love. I think it is not very common, and it was in the spring-time that I found my specimen; but we will examine the stream, if you like, on our way home; we may find other water-flowers, if not that one. There is a plant belonging to the same tribe, *Ranunculaceæ*, or Crowfoot."

"O that is only a small Buttercup!" said Fanny.

"Well, dear, the Buttercup is a *Ranunculus*, or Crowfoot. This is the small floweret, Crowfoot, known by its prostrate hairy stem, and its little prickly seeds. Most of the plants in this genus are hot and bitter, and one, the Corn Crowfoot, is poisonous."

"But, Miss Vaughan, you have not told us how this tribe is known."

"It is not so distinctly marked as the two others which you have learned. The leaves are generally deeply cut; the petals, five in number, sometimes more, but never less. The stamens, which are many, are placed on the receptacle. To which Linnæan class, then, does it belong?"

"Stamens inserted on the receptacle? it belongs, then, to Polyandria."

"Right; the Wood Anemone, which you admired so much in the spring, belongs also to this tribe; so does the Colombine, in which we found the Nectaries; and so does the Peony."

"And the creeping Buttercup which I found the other day by the water, Miss Vaughan?"

"Yes; the *Ranunculus Repens.* Now, Mary, I have never been here before; and yet I know that we are approaching your stream."

"How can you know that, Miss Vaughan?"

"I know it by a certain flower which I see, and which only shews itself where water is nigh."

"What, this yellow one? is it not very pretty? I think it looks like a Marigold."

"No; it is the Pulicaria or Flea-bane, so called from its being supposed to drive away fleas by its powerful smell."

"And there is my stream," said Mary, "so you are right."

The *Ranunculus Aquatilis* was searched for in vain; this disappointment, however, was in some measure made up for by the discovery of some very pure Water-cresses, with which the little girls filled their baskets, and promised themselves a treat for to-morrow's breakfast.

"Have Water-cresses got a botanical name?" enquired Fanny; "and do they belong to a tribe?"

"Most certainly, Fanny; they are entitled to the honour of both. Their botanical name is, *Nasturtium Officinale;* Nasturtium for the genus or family, and Officinale for the

species. Their tribe is called *Cruciferous* or *Cruciform.* You will find this tribe a very easy one to distinguish. It has always four petals placed crosswise opposite to each other, in the form of a Maltese cross, and six stamens, two of which are long and four short. To which Linnæan class does this natural order correspond?"

"To *Tetradynamia*, does it not?" replied Dora.

"Very well; there are a great many flowers of this tribe, but they bloom mostly in the spring. One (a very common one) you are likely to find, for it is almost always in blossom, the *Thlaspi* or Shepherd's-purse; it derives this name from a fancied resemblance in the seed-vessels to little purses. The flower is like that of the Water-cress."

"Is that it?" asked Mary, pointing to a little white flower in the nosegay in Fanny's basket.

"No; that is Penny-cress, *Thlaspi Arvensis*; it is something like the *Thlaspi*, but rather larger, and the seed-vessels are round instead of long, and have a sort of margin round them which those of the *Thlaspi* have not."

"And why is this named Penny-cress?"

"I suppose it was named in the days when silver pennies were in use; and that the seed-vessels were thought to resemble them. One resemblance is at least as striking as the other. Here is the Shepherd's-purse: now you see how different they are."

"O yes; this is much smaller. That makes four tribes that we have learnt to-day. Can you teach us one more, dear Miss Vaughan?"

"You have a great many yet to learn; but I am afraid that if we attempt too much at once we shall run a risk of

forgetting all; however, I will try to explain to you one more very large and important order—that of the composite flowers. They are called composite because they are compounded or made up of a number of little florets, each one being a perfect flower within itself, containing stamens, pistils, and all the organs necessary to produce seed. The Daisy, whose botanical name is *Bellis* (pretty), is a compound flower; so are the Dandelion and thistle."

"What! are all those tiny yellow things in the Daisy separate flowers? I should have taken them for stamens only."

"Yes; they are perfect flowers, although their various organs are too minute to be perceived. This order corresponds with the Linnæan class, *Syngenesia*."

"Does not the Chrysanthemum belong to it also?"

"Yes; and so does the China Aster."

"How thick the leaves are," said Fanny, looking up as they entered the avenue. "What millions and millions there are!"

"And out of all those millions, Fanny, you would never find two alike, not if you were to look the whole summer long."

"No! why not? I think I could."

"Try."

Fanny tried a long time, Dora and Mary helping; at length they gave it up astonished at their failure.

"That is a very wonderful thing, though," said Dora to Miss Vaughan.

"Yes; but is it not among the things that earth teaches of its great Creator? What human hand could compose

such a variety of form? Throughout the whole realm of nature, there never were found two things exactly alike; neither leaves, trees, flowers, fruit, stones, animals, birds, nor fishes; and what is still more striking, not two human countenances! Of all the millions that live or ever have lived upon the face of the earth, no two faces were ever seen in which there was not something different, something peculiar, which distinguished one from the other, however extraordinary the resemblance might appear."

"This fact tells of the existence of God; but to my fancy it teaches of something else also. It teaches Charity."

"Charity! how can it teach that?"

"When I reflect upon this variety in the external world and see the same variety extending to the minds, tastes and feelings of individuals, it occurs to me that it never could have been the design of the Almighty to make all men think alike. They cannot, and they never will in this world. It is not possible for them to do so; and for this reason I think we ought not to be bigoted and positive in our own views, and angry with others, who, equally earnest and sincere in seeking for the truth may yet see things differently to ourselves."

"Do you think this accounts for the variety of religious sects all over the world?"

"I think it does, mainly; Christians, Bible Christians, who build their faith upon the same foundation, may differ upon minor points which are not so clearly explained; each taking that view of the subject which the peculiar bias of his mind leads him to regard as the right one. And I believe that all, though different, may be accepted by God,

"who judgeth not as man judgeth." "One man esteemeth one day above another: another esteemeth every day alike. Let every man be fully persuaded in his own mind." I think if the spirit of that beautiful chapter, Romans xiv., were more studied than it is, there would be less misunderstanding upon the constantly recurring question—"What is truth?" Many are the silent lessons offered to us by the flowers of the fields, as Mrs. Barbauld so beautifully says—"Every leaf is an open book, every painted flower hath a lesson written on its leaves." While we were speaking of the Daisy just now, I saw Fanny pick one to pieces, and she seemed to be examining it very attentively. What were you thinking of, Fanny?"

"I was thinking," replied Fanny, "how neatly and prettily it was made; every little white petal tipped with rose-colour so delicately, and the dark green calyx under so nicely cut and ornamented; it looked as if such great pains had been taken to make it."

"And what did you learn from that, Fanny?"

"I don't know, but it made me think how great God is."

"So it should, my love; but there is still another lesson written on its leaves. It tells us of the perfection of God. Examine the lowliest flower that you meet with, and you find it faultless. You could not wish it otherwise, or fancy a single alteration that could improve it in its particular style, whether that style be simplicity, gaiety, modesty, gentleness, or any other that it may seem to characterise. Nothing could add to its grace. And as to fitness, what exquisite arrangements we discover to supply all its little wants. How perfect the machinery, even when too minute

to be perceived without a microscope. The mind of man could never have conceived, far less have accomplished the organisation of one of these little ones. I cannot observe all this without being reminded what perfection our God, that same Maker, must require of us, His reasonable creatures. To such a Being, the very essence of harmony, purity, and benevolence, how offensive must be the spectacle of anger, malice, strivings, envyings, vanity, and pride! How these hideous sins must mar, even in the sight of angels, the order of God's creation; and how much more in His, before whom the very heavens are not clean!"

CHAPTER XIV.

WHEN round Thy wondrous works below
My searching rapturous glance I throw,
Tracing out Wisdom, Power, and Love,
In earth or sky, in stream or grove;

When with dear friends sweet talk I hold,
And all the flowers of life unfold;
Let not my heart within me burn,
Except in all I Thee discern.

CHRISTIAN YEAR.

BOTANY had now become an all-absorbing delight to the young Hamiltons. Dora's latent energies seemed to have been kindled suddenly into action, and her old malady, ennui, forgotten in the engrossing interest of the new pursuit; and she acknowledged herself to Miss Vaughan, that not one of her charming romances had ever banished the enemy so effectually, or at least for so long a period. Having once applied her mind earnestly to the subject, her naturally clear and retentive memory easily mastered the technical difficulties, which at first sight appeared formidable; and with every fresh conquest her enjoyment increased. Mary's abilities were not so great as those of her sister, but she had an abundant share of emulation, which in a great measure made up for the deficiency; and with Dora's ever ready help, she succeeded in keeping pace with her pretty equally. Even little Fanny had gained a very creditable share of scientific knowledge for so young a child. Miss Vaughan did not like her memory

to be taxed at present with the Linnæan system, but she had learned to distinguish readily nearly all the natural orders; and she could tell not only the names of most of the wild flowers she met with, but also much that was interesting concerning their habits, uses and relations to other productions of nature, etc. And all this knowledge had been acquired without the aid of books; simply by conversation. While her sisters were rambling here and there, filling their tin cases with specimens to be studied at leisure, Fanny used to bring her flowers to Miss Vaughan to hear a story about it, as she termed it. The flowers were then carefully preserved, to be taken with her when she went into the dining-room after dinner, where her privilege was to relate the said stories again to her papa. Her punishment when she had been very very naughty, was to be deprived of the flowers, before going down stairs, a punishment so great as to be very seldom inflicted. One day, Fanny's attention was attracted by a great number of small insects, which covered the stem and leaves of one of her flowers. She ran to shew it to Miss Vaughan.

"Can this be a Catchfly Campion, Miss Vaughan? I think it must belong to the genus of Campion, though the flowers are very small. The stalk is so hairy and sticky, that the poor insects which alight on it cannot get away again. Just see what a number of prisoners are caught here!"

"Ah, you have found the Silene Anglica, the English Catchfly. It is a less common species than the Bladder Campion, and, as you say, much more deserving its name, Catchfly."

"Are there any other plants which catch insects in this way?"

"Yes, the Sun-dew, which is found in bogs, is covered with hairs that perform the same office. This plant belongs to the same order as the Dionea of South Carolina, which is still more remarkable. The hairy leaf is composed of two valves, which have the power of opening and shutting, and are edged round with small teeth, which fit tightly into each other when closed. The moment that a hapless insect rests upon the little irritable hairs which cover the leaf, it opens and shuts again instantly with a snapping noise; and there stays the poor little victim shut up in a living tomb for ever, unless some kind hand should happen to come to its rescue. I have heard of as many as six flies, four or five spiders, and twelve dumbledores, having been taken out of one leaf. It has been supposed by some persons, that these insects serve as food to the plant."

"What, a plant feed upon insects! O Miss Vaughan, you don't surely believe that?"

"I think it not at all impossible, indeed, Fanny. There must be some design in this singular habit of a plant, as we see, wherever we turn our eyes, that nothing, however minute, is ordered or permitted without design. I cannot, however, assure you that this is the design in question with regard to the fly-trap; but it is a fact that plants have been fed upon chopped meat by way of experiment, and they have been found to thrive."

"Really, Miss Vaughan, I shall begin to think soon that plants are not plants after all, but animals, with feeling and instinct, like other animals, if not sense, too."

"It is, indeed, rather difficult to define precisely the points of difference between the two classes," replied Miss Vaughan, "and yet, at first sight, it seems so very easy. Any one, for instance, can explain the difference between a Rose and an Elephant, or a Donkey and a Thistle; but let them try to point out the distinguishing qualities of each class, and they will be surprised to find themselves puzzled."

"Let me see, now," said Fanny, whether I shall be puzzled. "Animals breathe, so do plants; animals eat and drink, so do plants; animals can be starved to death, so can plants; but animals can move about from place to place, and so can *not* plants. Eh, Miss Vaughan?"

"So you think you have caught me already, do you? But stop a minute, I assure you that plants *can* move. Monkshood, for instance, often changes its locality—very slowly, it is true, and never more than a few inches; but a certain species of Orchis has been known to travel round a whole garden."

"You mean," interrupted Fanny, "that it spread round the garden."

"No, indeed; I mean that it moved, root and all, from its birthplace."

"Well, that is curious; but I can tell you one thing yet for certain that plants cannot do, they cannot sleep like animals."

"Indeed! What will you say, then, when I tell you of a certain wonderful Palm, called the 'moving plant of the Ganges?' All day long this plant preserves a regular pendulum motion. When there is not a breath in the air, or a single cloud, still it rocks itself backwards and forwards, as

if in pain; and sometimes as you watch, it seems suddenly to shudder, so as almost to make you shudder in sympathy with it. When the sun sets it falls prostrate on the ground in so sound a sleep, that it can hardly be raised, even by force."

"O Miss Vaughan, I would travel to India on purpose to see that plant. Are there any others which sleep, or is it the only one?"

"I think," answered Miss Vaughan, "all plants may be said to sleep, when they fold their petals in the evening, just as you shut your little eyes when you lie down in bed. But in some the sleep is more evident than in others. Linnaeus relates a story about a Lotus he met with, that struck him as being remarkable. He was walking one morning beside a river, when he perceived a Lotus of peculiar size and beauty. He tried to reach it; but not succeeding, he marked the spot and went home. In the evening he returned to it, armed with a long stick; but in vain he searched for this beautiful flower. He knew the exact spot in which he had left it blooming, but it was no longer there. Much disappointed that some other hand (as he thought) had deprived him of his prize, he returned home again. The next morning, however, he passed the spot once more, and there bloomed the flower as it had bloomed the day before. He did not pick it then, but in the evening of that day he resolved to watch it; and he saw the leaves gradually close over the blossom, and the latter disappeared under the water. In the morning the leaves unfurled again, and the flower awoke, and lifted up its head!"

Fanny now looked perplexed. "I suppose, then," she

said, "there are no distinguishing qualities; and yet there must be. O yes, I have found one at last. You cannot prove to me, I think, that plants can cry out, and make a noise like animals."

"No; I will not undertake to prove that. They are silent certainly, except in the popping and snapping of the seed vessels that we have often talked about; but that being a mechanical noise, cannot be compared to the voluntary cry of an animal."

"So, then, plants eat, drink, sleep and walk, and do everything, in fact, but talk," said Fanny.

"Yes; but on the other hand, there are animals that never eat, and never change their position, during their whole lifetime."

"Ah! you are thinking of sea anemonies, I know; we used to find numbers of them at Weymouth sticking to the rocks. Ah! but they do change their place sometimes, for I have seen them swimming in the water when we have been out in a boat."

"I did not mean, Fanny, that the *Actinia* (which is the name of the genus) have no *power* of locomotion, but they have not the *will*, so long as they are undisturbed. They never leave the rock, on which they are born, and to which they seem to grow, unless torn away by the tide, or by some other accident; but when once afloat they are able to swim, which they generally do, until they find a suitable object to attach themselves to, either a stone or the sand in shallow water."

"What funny things they are," said Fanny. "Mary and I could never feel quite sure whether they were animals or flowers."

"They are animals undoubtedly, but seemingly of the very lowest grade; and to the eye of a casual observer, they may well appear like a mere connecting link between the two kingdoms. Yet many learned men have thought it worth their while to bestow much labour and pains in tracing out its history and its organisation. The latter is found to be very simple, yet perfectly adapted to its tiny wants. Its sensitiveness and its vitality are astonishing. The coloured border, which, unfolded, gives it such a flower-like appearance, is composed of nervous fibres, which are so exceedingly irritable, that they recoil instantly on the approach of a finger, or any instrument that offers to molest it, without waiting for the touch. A sudden noise causes it to start, and it is even affected by a smell and by strong light. If placed in fresh water they die. This singular irritability is said to increase with their sufferings."

"Poor little things, then they are much less stupid than I thought them. I did not suppose they had even sense enough to suffer. But what do you mean by their vitality?"

"I mean their singular power of reproduction. You may cut them off the rock with a knife, and cut them again across and across, and each divided part will form itself into a new animal, and produce young ones in its turn. Even the base, which remained on the rock, will live and grow, and in a short time become a complete *Actinia*. There are several species of *Actinia*, some of which inflict a sting when touched, which has given them the name of Sea-nettles."

"Now I think, Fanny, we had better sit down and wait for your sisters."

"Oh, yes, do; I will find you such a snug seat;" and

after a short deliberation Fanny seated Miss Vaughan on a little grassy mound, her back resting against the trunk of a neighbouring tree, whose rough roots she declared formed "a beautiful armchair." She had hardly time to throw herself on the grass by her side, when she heard her sisters' voices in the lane on the other side of the hedge. "Ah, Dora and Mary," she exclaimed, as she ran to meet them, "I am going to puzzle you famously this evening. I shall propose a question, and you will all have to find out the answer; a very easy question you will say it is, until you try to guess it. 'What is the difference between a plant and an animal?' but you must not tell them, Miss Vaughan, dear, or it will spoil all the fun."

Miss Vaughan promised to keep the secret, and Dora and Mary undertook to think over the problem and prepare an answer by the appointed time.

'she heard her sisters' voices in the lane on the other side of the hedge." *Page* 122.

CHAPTER XV.

"THESE are Thy glorious works, Parent of good,
Almighty, thine this universal frame,
Thus wondrous fair; Thyself how wondrous then?
Unspeakable, who sitt'st above these heavens,
To us invisible, or dimly seen
In these Thy lowest work; yet these declare
Thy goodness beyond thought and power divine.
MILTON.

As winter approached, the little party found themselves obliged to relinquish their rambles over fields and woods, and to confine themselves chiefly to the sober high-road. Submitting with regret to this necessity, they decided that it would be advisable to put away their collection of dried flowers (amounting to about thirty specimens) until the return of spring, and in the meantime to increase their store of botanical knowledge, by perusing some interesting works of Miss Vaughan's selection, and by conversing upon them with her in the course of their daily walks, as they now did naturally about everything that interested them.

"Do you know, Miss Vaughan," said Mary one morning, "that there is a Pitcher-plant in Sir Henry Clark's hot-house, and Papa has promised to take us all there some day to see it; he says he believes that much that is related of this plant is fabulous. I should like to know how much that is."

"I believe I can tell you, my love, how much of the

marvellous is connected with what is true in the accounts which are sometimes given of it. In the first place it is *not* a native of the desert, where it has been said to refresh, with its miraculous draught, the thirsty traveller as he passes, but grows *only* in the marshy ground of Ceylon. Neither is it water which it distils nightly in its pouch, but a sweet luscious liquid, and the flavour of which is said to resemble that of roasted apples. In the morning it is thick and milky, but the action of the sunbeams renders it as fine and clear as water. Part of it disappears during the day, and is renewed every night. Attached to the pouch or gland is a tendril, by means of which it hooks itself on to a neighbouring plant, and when full, the lid gives way and the contents are poured upon the ground. It has been said that the lid then shuts again, and the pouch refills itself. This is a mistake; the lid, once open, cannot reclose, and the flower withers away on the stalk, reminding us of the beautiful figure of Scripture, 'for the pitcher is broken at the cistern.'"

"And, pray, what is the definition of glands?" continued Mary; "I so often meet with the word in descriptions of plants, and I do not clearly understand what it means."

"I do not wonder at your being puzzled, Mary," replied Miss Vaughan, "for it is a word which seems often to be used in different senses. What are generally termed glands, however, in plants, are small globular bodies which secrete a liquid, and which are placed on the tips of hairs. The pouch of the Pitcher-plant is a very large gland; they are usually so minute as to be invisible to the naked eye; as, for instance, in the Nettle, the glands of which on the

summit of each little hair with which the leaf is covered, are filled with poison, which, on being pressed, enters the skin and inflicts the sting. The minute portion contained in those of our nettle is only sufficient to cause a slight inflammation; but the Nettle of Chili, in which the glands are larger, contains enough to produce a wound in the flesh which is extremely dangerous, and sometimes fatal. I knew a person who had his arm paralysed for three days by coming in contact with one of these nettles."

"Then," said Dora, "the liquid which the glands secrete is of a different nature in different plants."

"Yes; very different: in the Nettle it is poisonous, and in the Pitcher-plant it is sweet and wholesome. Manna, another wholesome secretion, is found in glands of the *Ornus Europæa*. This is the genuine Manna, and is that which is used in medicine; but several other plants also produce sweet secretions, which are considered to be kinds of Manna."

"Is that the Manna which the children of Israel found in the wilderness?" enquired Fanny.

"No, my love: I believe it is very uncertain what sort of manna that was. Some writers have supposed it to be the produce of a plant which is found in Arabia and Syria, and which they call for that reason *Manna Hebraica*; while others believe it to be that of a species of Tamarisk, growing on Mount Sinai. The little prehensile organs which enable the Ivy to climb up a wall or a tree, are also called glands; and another interesting example of design is that these glands are found on the stem *only* when it grows perpendicularly: the moment it assumes a horizontal direction they are discontinued, because no longer necessary. Stop a

moment, while I pull off a piece from this old tree, which is embraced so lovingly by it. There, do you not see the glands like little hairs underneath the stem?"

"O I see them plainly; how firmly they stick into the bark."

"Very well: now the next time you walk through the wood, examine one of those long stems you find trailing along the ground, and you will perceive it to be perfectly smooth."

"*All* plants do not possess glands, do they?" asked Mary.

"No; not even all those which secrete fluids: in many of that kind no glands can be detected."

"How very curious it seems," said Dora, "that such a variety of secretions should exist in plants, while the sources from which they are derived are always the same—the earth and the atmosphere! One secretes manna, another morphine, and another"—

"And another milk," interrupted Mary.

"Miss Vaughan, would you not like to see the Cow Tree of the Caracas? Is it really true that the natives go and tap it every morning at sunrise and fill their calabashes with milk for breakfast?"

"Quite true, Mary. Humboldt, the celebrated traveller, gives this account of it. Speaking of the liquid he says, it is very rich and glutinous, and grows yellow and thickens on the surface, just like animal milk. I have been told by a person who had seen and tasted this curious milk, that the natives of Brazil use it as a remedy for diseases of the chest; and that he had analysed a portion of it himself, and found it to be a solution of Indian rubber. I then remem-

bered to have read in some periodical of a solution of Indian rubber being a cure for consumption, the discovery of a German chemist; and it struck me as being a rather singular coincidence."

"Yes," said Mary, "that does seem remarkable, unless the German chemist happened to be in the secret about the Cow Tree, and knew the use which the Brazilians make of it."

"And another remarkable circumstance about the Cow Tree," said Miss Vaughan, "is, that it is a member of the *Urticaceous* order, the plants belonging to which yield a milky juice, which is in all other cases highly poisonous. Many innocent plants, however, have lately been discovered in poisonous orders; even in the deadly family of *Apocynaceæ* there is one called the Hya-hya Tree, of Demerara, which yields a rich milky fluid, perfectly harmless, though not so abundant and wholesome as that of the Cow Tree. To this same order belongs the celebrated Tanghin, of Madagascar, which produces the strongest known poison in the vegetable kingdom. The noxious juice which exudes from the stem of the tree is less fatal than that contained in the kernel of the nut. Do you remember seeing among my treasures a nut about the size of a small chestnut, with poison marked on it?"

"Yes; and you said it was sufficient to kill every one in the house."

"That was the Tanghin bean. It is said to contain poison enough to destroy twenty persons. Its great use in Madagascar was formerly as a means of trial in the discovery of any crime the evidence of which was not positive,

the innocent being supposed able to resist its power, while the guilty suffered under it."

"That was like the ancient trial by ordeal in our own country—making people walk over red hot ploughshares, and throwing them into ponds with their hands and feet tied, to escape with their lives if they could."

"Just so, Dora; and both are instances of the natural leaning of the human mind to the supernatural—a leaning of which we have examples in our own day little less absurd. Radama, the late king of Madagascar, was anxious to abolish this use of the Tanghin, and endeavoured to do so by every means in his power, but he found it very difficult to overcome the prejudices of the people. Once, the good king was taken ill, but got well again by the use of mercury. You know that the natural effect of this medicine is to make the mouth sore, and this effect it accordingly had upon King Radama. But the physician attending him, who had administered the medicine for, I suppose, the first time in his life, was not at all prepared for such a result, and after examining the mouth of the poor king very attentively, declared that he had been poisoned. He therefore insisted that the Tanghin should be administered severally to all the servants of the king's household, in order to find out the guilty party. Radama protested against the cruel measure; but in vain. The whole establishment were shut up together during the night, without food, and in the morning they were brought out, one by one, for trial. The physician who undertook the discovery, commenced his horrid task by pounding the Tanghin bean to a pulp, between two stones; he then placed a small portion on the back of the tongue of

each individual. The effects were not the same upon each. Some vomited, and threw up the poison easily from the stomach; others were seized with convulsions, and being unable to vomit, died in dreadful agony."

"Poor men! and they were all innocent, too!" exclaimed Fanny. "That stupid cruel doctor deserved poisoning himself. And how grieved the poor king must have felt. He must have been a good man, I think; was he not?"

"He was, indeed, Fanny, both a good and great man. His whole reign was spent in one earnest endeavour to improve and civilise his barbarous country; and he accomplished a great deal of good. He established a trade with the English in the Mauritius, and sent young people there to receive instruction; some few were even sent to England. He established schools also in Madagascar, and was a great friend to the missionaries; and through their persuasion he was induced to abolish the slave-trade, which was formerly carried on there to a great extent, and, I am sorry to say, has been practised again since his death. He also introduced the English arms and discipline into his army, which I dare say made him more popular with the Madagasses than any other of his acts, for they are a very warlike people."

"But we have no colonies there I, believe?" said Dora.

"No, the unhealthiness of the climate has, I believe, prevented the attempt being made by us; but the French have tried, and at length succeeded in establishing some small settlements."

"I was going to ask you just now," said Mary, "whether the Rain-tree, that I was reading about the other day, is of

the same nature as the Cow-tree; I mean, whether the water which is said to fall from it is a secretion of its own?"

"I believe not, Mary; from the accounts given of it, it appears that this tree has the power of attracting a cloud, and making it fall in rain."

"What is that? do tell me about it," said Fanny.

"It is a tree," replied Mary, "growing on a lonely little island in the Atlantic, where rain does not often fall for a long period; but sometimes a cloud is seen to rise out of the ocean which this tree, and this alone, has the power of attracting and condensing, so that the water falls down in a stream beside the trunk, where it is caught in a tank, which the poor thirsty natives take care to keep always placed there ready for the purpose, and thus they manage to have nearly always a supply of fresh water. They give it the name of the Rain-tree."

"Another of the merciful provisions of Providence," observed Miss Vaughan; "and not more wonderful than a thousand others."

"Yes, I remember some time ago I should almost have doubted such a story, even if I had read it in a book," said Mary; "but I can believe it now, for it is not a bit more wonderful than many things which I have seen with my own eyes."

"And I have come to the conclusion," said Dora, "that there *is always* a provision made for every want."

"Always, my dear girl, you may depend upon it; and tell me, since you have made that discovery are you not happier, Dora? Can you not look up with firmer faith to the universal Giver, and feel that all your wants and weak-

nesses are known and cared for? and if not immediately supplied, yet that they will be ultimately, and that there must be wisdom and design in this present denial, though the eye of faith be too dull to perceive it? The poor Rose of the Desert did not know why it was torn away from its birth-place, and driven along by the rude wind over the scorched ground until it reached water; but He who guided the wind knew. The flower had a purpose to accomplish, and He gave it the means it lacked, and so the end of its little being was fulfilled."

"Yes, I like to thing of that; it always makes me recollect of how much higher value we are, created to live for ever; and then I wonder how people *can* mistrust God as they do, when they are so anxious about the future. I cannot help fancying, that if botany were more studied there would be less irreligion and less sin in the world."

"Less infidelity there would certainly be, Dora. Sin will always be committed while human nature remains weak and prone as it has been since the fall; for even the good that we would we cannot do; but I think that no one who looks often and earnestly into the book of nature, can dare either to say in his heart 'there is no God,' or yet to live in wilful rebellion against Him."

"Do you remember Bishop Heber's hymn for the 15th Sunday after Trinity?"

"I do," replied Fanny, "for I learned it last week; do let me say it."

"Lo the lilies of the field
How their leaves instruction yield?
Hark to nature's lesson given
By the happy birds of heaven,

Every bush and tufted tree
Warbles sweet philosophy;
Mortal, fly from doubt and sorrow,
God provideth for the morrow!

Say, with richer crimson glows
The kingly mantle than the rose?
Say, have kings more wholesome fare
Than we poor citizens of air?
Barns nor hoarded grain have we,
Yet we carol merrily.
Mortal, fly from doubt and sorrow,
God provideth for the morrow?

One there lives, whose guardian eye
Guides our humble destiny;
One there lives, who, Lord of all,
Keeps our feathers lest they fall.
Pass we blithely then the time,
Fearless of the snare and lime;
Free from doubt and faithless sorrow,
God provideth for the morrow!".

A rather long pause followed the recital of this hymn, which was at length broken by Fanny exclaiming:—

"I wonder why some plants are green all the year round and some are not; what makes the difference?"

"Dear Fanny," replied Mary, "what a silly question! you might as well ask why some flowers are red and others blue, and others—"

"Stop a minute," interrupted Miss Vaughan; "you will be surprised when I tell you, that it is possible to find out not only what makes evergreens retain their leaves in winter, but also what gives colour to flowers. Fanny's question is very far from silly; it pleases me, on the contrary, because it shews that she is acquiring a habit of reflection, and that she begins to seek for a cause in every wonder that strikes her eye. In order to find out what makes evergreens keep

their leaves in winter, we must first find out what makes other plants shed theirs. Tell me then, Mary, why plants which are not evergreens lose their leaves when summer is

Mary hesitated for a moment. "The cold, I suppose, makes them wither away, and then they drop off."

"Then how do you account for the ash and the poplar losing theirs long before the approach of winter? And if withering causes them to drop, how does it happen that, when the branch of a tree dries or is cut off during summer, the leaves though withered still adhere to it firmly."

Mary looked perplexed for a minute, and then begged Miss Vaughan to help her out of the difficulty.

"You know," replied the latter, "that the nourishment of the leaves depends chiefly upon the rise of sap from the root. In spring-time this rise is most rapid and abundant; then the leaves are largest and most vigorous. As the season advances the rise of the sap diminishes, and at length almost ceases, while at the same time the leaves continue to send down all the nourishment they receive from the air as before; consequently, they soon become drained and dried up. This is the cause of their withering at the end of summer, and the same thing happens when a branch is cut off at any period, being in the same way deprived of its sap."

"I understand that," said Mary, "quite well, but now what makes the withered leaves fall off?"

"Well, can any of you guess?"

"I think," replied Dora, "but I am not quite sure, that it must be caused by the pressure of the bud under it, because I know that the new buds *are* formed in autumn."

"You are perfectly right, Dora. The little bud swells and pushes itself against the old leafstalk until it forces it to quit its hold and make room for the new comer. Now the reason that evergreens do not follow the general rule is that their juices are very thick and glutinous, having a larger mixture of oil than other plants. This enables their leaves to support themselves without the aid of the sap, and to preserve their bright green hue. They have also a much smaller number of breathing pores, so that there is less evaporation going on. These circumstances enable them to endure a greater degree of heat and drought than other plants; still they flourish much better in our damp climate than in countries where the summers are hotter and drier."

"But do evergreens never change their leaves?"

"Yes, but not until the new ones are formed and full-grown in the spring, so that the change is not perceived."

"Well, do you know," said Mary, "I really was silly enough to think that the leaves on the laurel were as old as the laurel itself, and that they never had changed or intended to change."

"Or rather, you never thought at all about it, little giddy girl."

"Well, perhaps that *was* the case after all. But now that we have settled the question of evergreens, will you, dear Miss Vaughan, explain what produces the colours of flowers?"

"Willingly, dear, to the best of my ability and your comprehension; but it not a very easy subject. Plants are influenced in various ways by light, heat, air, moisture, and electricity. The varied colours of flowers are produced

partly by the mixture of iron which enters largely into the soil, chiefly by the action of the sun's rays. It seems mysterious how this can produce a different effect upon different flowers, but so it is, and it may be proved by the simple experiment of plunging flowers of different kinds into hot water, when some will be seen to close up, and others to expand and brighten into their natural colour. You know that when quite excluded from the sun's rays plants invariably become white. This was the case with some seeds which Parry planted in the Arctic regions. They belonged to plants of various colours, but all came up white alike. We may even remark a difference in the *prevailing* colour of flowers in each season of the year which shews that it varies according to the intensity of the sun's rays. In spring our flowers are chiefly blue or white, in summer pink deepening into red, and for the fading glories of autumn we have yellow. There are flowers which even change their colour at a regular hour of the day; which are white in the morning, pink at noon, and deep red towards sunset. Pliny speaks of these flowers and calls them 'joyous flowers,' because they smile, he says, when you look at them; and Herschel describes the phenomena as being occasioned by the action of the sun-beams."

"Well," said Mary, "it is certainly true that almost all the flowers we have gathered during the last month or two have been yellow, but it never struck me that there was any particular cause for it."

"Depend upon it, my dear child, that every thing in nature is governed by a cause. Nothing happens by chance, all is order, harmony, and design."

"I can understand," said Dora, "that plants are influenced by light, heat, air, and moisture, but pray how are they influenced by electricity?"

"The electric action attending some plants," replied Miss Vaughan, "would indeed greatly astonish you or any one who had never witnessed it. There is a plant on the western coast of Africa, whose name I am sorry I cannot tell you, which as soon as it attains perfection ignites spontaneously and consumes itself away. I could hardly have believed this account, if it had not been told me by my brother who, while stationed there, frequently witnessed the phenomenon himself. He says it was not the effect of lightning, as I should have supposed, as it happened invariably to this plant and no other. Some plants are luminous in the dark, such as the poppy Marygold and the Nastertion of India; and the mines of Peru are said to be illuminated by the brilliancy of a tiny flower. But the most beautiful of all this very wonderful class is the *Rhigomorpha phosphorescens*, a genus of fungus which springs up in mines, damp cellars, and dark caverns, where it sometimes becomes phosphorescent. There is said to be a magnificent display of this singular fungus in the famous Robin Hood's cave near Nottingham. I have not seen it myself, but I heard it described by an eye-witness as 'a sight worth a journey from the other side of the world. The whole cavern appeared to be lighted up with something that looked like burnished gold inlaid with emeralds, but which proved on microscopic examination to be a simple net-like structure of fibres resembling moss.' Some have supposed the dazzling effect in this instance to be produced *not* by

electricity, but simply by a ray of light entering at some unseen aperture and being reflected on the damp wall, in the same way that a cobweb wet with dew on a fine summer's morning reflects prismatic colours from the sunbeams. Whether this be really the case I cannot inform you, but I should be inclined to think not, as it is a well-known fact that this phosphorescent fungus *does* exist in other places."

"As soon as I am grown up I shall go and see it," said Mary; "and then I can favour the world with my opinion."

"Which coming from so great an authority will no doubt decide the question; but I commend your enterprising spirit; there is nothing like proving all things."

"O Miss Vaughan," exclaimed Fanny, "do just look at the Mistletoe on the top of that Oak. I only wish I could reach it. We will ask papa to have it gathered for Christmas. Do you know, I have never seen Mistletoe quite close."

"Nor I," replied Mary; "and I cannot imagine how it contrives to grow upon another tree without a root of its own. I think that is as wonderful as anything that we have talked about to-day."

"The Mistletoe, Mary," replied Miss Vaughan, "belongs to a class of plants which are termed parasitical, or air-plants. It is a class possessed of extraordinary beauty, and of very singular features. Their nature is to live upon other plants, and by consuming their juices, to injure and sometimes destroy them."

"Then I dare say that was the reason why the gardener cut off a beautiful bough of Mistletoe from the old Apple-tree in the orchard. I thought it such a pity," said Fanny.

"Yes, that was the reason, no doubt; it frequently attacks Apple-trees, and is very injurious to them, preventing them from bearing."

"I always thought," said Dora, "that parasites were those plants which merely twined round others for support, and have their root in the ground. I think I have heard them called so."

"Very likely, they are sometimes called so, but improperly; the real name of those plants is Ephaphite, or false parasite. They are equally destructive to the plants they attack, not by stealing their nourishment, but by strangling them and impeding their growth. Some years ago, destruction was threatened to all our clover-fields by the Luscuta, one of this genus, which seemed to baffle all attempts at extermination. Its invasions were so obstinate, that it was found necessary at length to place the infected field in quarantine, by digging a trench round it so as to prevent the possibility of further communications. The most curious and beautiful parasite that I have ever seen is the lofty Dove-flower. It exhibits in its blossom the miniature form of a snow-white dove sitting on its nest, and covering with expanded wings three small white eggs! The plant is said to grow to the height of eleven feet from the bough of the tree into which it inserts itself. The natives of India carry it in religious processions, and call it the *Sacred* Dove-flower. When I first looked at it, I could hardly persuade myself that it was a flower, and not a bird; and I did not wonder that it should excite such a superstitious veneration in the minds of the poor Indians."

"Do you think we shall find one in Sir Henry Clarke's hot-house?"

"I think it not unlikely; I hope we may, for I should like you very much to see it. The one I saw was in the Botanical Gardens in Dublin, but I believe they are not uncommon. You know that these air-plants (the *true* parasites) have no root, and that all their nourishment is derived from the atmosphere through their leaves, and from the tree through the stems which they insert into it. What then will you think of one which has neither root, nor stem, nor leaf? the Rafflesia Arnoldi of Sumatra."

"But what has it then?" exclaimed all the girls in a breath.

"Only one enormous flower, each petal of which is a foot in length, and the circumference of the whole no less than nine feet! It has a nectary in the centre large enough to contain several gallons of water."

"Why, what a monster it must be! how does it contrive to support itself without a stem?"

"By means of a natural cerement, with which it sticks itself on to any tree or plant within its reach, apparently growing to it.

"Then do not the lichens which grow on the trunks of our trees rather resemble it?"

"Yes, in mode of growth, but not in size and appearance, the Rafflesia being a perfect, and very beautiful flower. Travellers from the forests of the East India islands appear to be at a loss for words to convey an adequate idea of the brilliancy and variety of the parasites that adorn them. Imagination, they say, can hardly picture a form which they do not take. Insects of all kinds and colours, birds and animals, toads with forked tongues

sprawling over other flowers, grinning faces poised in the air so delicately, that every breeze sets them in motion; festoons hanging from tree to tree, like crowns for the coronation of the forest kings, and covering their rough trunks with dazzling chains of every imaginable hue. 'So do they beautify the wilderness and make the solitary place sing for joy.' Denizens of the air, where do they come from?"

"Where indeed," repeated Dora musingly; "I could almost fancy that they were fallen from unknown worlds on high, for they must seem of a different nature to the vegetable life of our earth."

"Humboldt," replied Miss Vaughan, "supposes that plants *do* exist in the higher regions of the atmosphere, and that floating upon its undulations hither and thither, they are made visible to us by meteorology. However that may be, it is generally admitted that plants give colour to snow. Crimson snow, and blue and yellow and green snow, have been met with by travellers; and red and black hail. Red snow is often visible in Switzerland, and Humboldt found some in America 6,000 feet above the level of the sea, which he says was evidently coloured by plants. Black rain I have seen myself in Ireland, and it left a number of inky spots upon the door-steps, which many succeeding showers of pure water failed to wash out. But the cause of this phenomenon is, I believe, very doubtful. But we must resume this interesting subject another day, for I see your kind mamma coming down the avenue to meet us."

CHAPTER XVII.

WHEN Friendship, Love, and Truth abound
  Among a band of brothers,
The cup of joy goes gaily round;
  Each shares the bliss of others.
Sweet roses grace the thorny way,
  Along this vale of sorrow;
The flowers that shed their leaves to-day
  Shall bloom again to-morrow.
How grand in age, how fair in youth,
Are holy Friendship, Love, and Truth.

MONTGOMERY.

A FEW weeks before Christmas, the happy school-room party broke up for the yearly holiday. Strange to say, there was almost as much of regret as of joy displayed on this occasion. It was not that they did not as thoroughly enjoy as any other children the pleasures natural to their age; but this enjoyment now involved a separation from the kind friend with whom they had become so accustomed to share all their pleasures, that it seemed as if something would be wanting when she was not among them as usual. Miss Vaughan had already made herself very dear to them all, and to Dora especially. Fanny's little arms stole many times round her neck the day before they parted, and she was many times on the point of making a petition to her to stay at Ash Grove during the holidays, instead of going away. But Dora had told her it would be very selfish even to wish such a thing, because Miss Vaughan had dear

parents just as she had, and brothers and sisters also, from whom she had been parted a great while, and whom she longed to go and see. So Fanny smothered her wish in kisses, instead of speaking it. Yet she could not taste her breakfast on the first morning of the holidays, nor yet repress a few tears when she watched the carriage drive off which was to convey Miss Vaughan to the station. But a whole family of cousins had been invited to Ash Grove, to make Christmas pass merrily, and their arrival soon banished all other considerations. At the expiration of six weeks, Miss Vaughan returned to them. She was most joyfully received; and her cheerful spirits showed that she felt herself no longer a stranger among strangers, but an established member of a happy united family. But there was something in Dora's eager welcome different to the rest; something in her look and manner which Miss Vaughan's observing eye did not fail to perceive, and which gave her an uneasy feeling. It was the old look; she knew it well. Tired with her journey, she had retired early to her room, and was sitting there thinking about Dora, when a tap at the door startled her, and Dora's voice asked permission to come in.

"I knew you were not going to bed just yet, dear Miss Vaughan; and I did so long for a little quiet chat. It is a long time since I have enjoyed one. O you cannot think how I have wished these stupid holidays to be over, and what a great comfort it is to have you back again."

And Dora drew a stool to the fire and sat down. There were tears in her dark eyes as she looked up as if wishing to say something more, but not knowing how to begin. Miss Vaughan looked at her earnestly and sadly. She guessed

too well what had made the holidays appear so long, and what had brought back the dissatisfied expression to Dora's naturally open and ingenuous face. Dora was not understood in her own family: characters like her's seldom are. They saw her irritable in temper and reserved in manner, and apparently liking to keep apart unamiably from the rest. But they did not know that an over-sensitiveness (that great misfortune to the possessor), was the secret cause of all that seemed strange and unlovely in her outward life. How this morbid tendency had been fostered by injudicious indulgence, has been already explained. Miss Vaughan knew well: her long experience and her earnest love for children had taught her to read their hearts; and thus she guessed, very nearly, all that Dora had to tell her now.

"It is a very great pleasure to me, my love," she replied, "to feel that you are glad to have me with you again; but not at all so to hear that you have not enjoyed the holidays which promised so much pleasure. What can have been the reason of this?"

Dora tried to answer, but tears choked her voice, and, covering her face with her hands, she burst into an uncontrollable fit of weeping. Miss Vaughan waited silently until she had had time to recover herself, and then gently and by degrees drew from her all that she longed, yet dreaded, to tell—the history of her trial and her disappointment—her dislike to the society of the young ladies who had been staying with them—various conversations which they had held together generally ending in worse than useless argument, in which Dora grew irritated and lost her self-command—her finally yielding to Mary the task of entertaining her cousins,

and retiring to her own room to take refuge in study—her mamma's dissatisfaction at this, and desire that she should join in the general amusements—her unwilling compliance and bitter regrets over the wasted time—and then, what seemed to weigh more heavily on her heart than all, her vexation at perceiving all the while how Mary seemed to enjoy the society of those trifling girls, how much gayer and happier she seemed now than often when alone with her, how merry was her laugh, and how little she seemed to sympathise with the cause of her sister's unhappiness.

"It was not jealousy," she added earnestly; "I only felt how lonely I was, and that I had no friend but you."

Here Dora looked up, and saw such a look of sorrowful anxiety on the face that bent over her, that she stopped speaking.

"Dora, my love, I cannot listen to the expression of such feelings as these. I wish, indeed, to be your true friend; and your affection is very dear to me, but remember, I can never be to you what your sisters must be. They are the friends of your life; and, as you value your happiness, you will never encourage a thought that may tend to dissolve the natural tie by which Providence has bound you to each other. And now let me point out to you how very wrongly and foolishly you have acted. Have you not brought all this discomfort upon yourself by consulting your own pleasure in the first place, disregarding the wishes and feelings of others? And in doing so you have lessened the happiness of those dear to you. You think not; but I am sure you have; I read it in your mamma's eye every time she looked at you this evening; you know how much she enjoys see-

ing you all cheerful and amused together; and I need not remind you, Dora, of the duty of sacrificing at all times your own feelings to hers."

"I am sure I would not make mamma unhappy about me for the whole world if I could help it," replied Dora tearfully.

"I know you would not wilfully; and therefore I wish to bring you to see how we mar our own peace, whenever we yield to the natural selfishness of our hearts. And with regard to Mary (as I have often told you), you increase the want of sympathy between you that you complain of, by making yourself mysterious and incomprehensible to her. You know that she is different to you both in disposition and in taste, and she cannot, however she may wish it, enter fully into all your thoughts and feelings. It is not because she is younger than you, but because she is differently constituted, and her mind has an opposite bias. But people of opposite tastes need not necessarily disagree with each other. Quite the contrary. I have often found the most dissimilar characters blend together the most harmoniously; and I think further, that the very view that Providence has in placing such individuals together in families is to draw more closely the ties that unite them to each other. The peculiar failings of each seem to make them more dependent upon each other's charity, and their various distinct qualities seem purposed to contribute towards the general comfort of the whole. How rare a thing it is to meet with two sisters or brothers with the same dispositions; and it cannot be supposed that there is less wisdom and design employed in the arrangement of a human family than in that of the various

organs which constitute the existence of each little perishable herb! 'Ye are of more value than these.' Nor can it be presumed, that He who has given us the command to 'love one another with pure hearts fervently,' would place us under circumstances where it is impossible to do so. Depend upon it the fault, where it exists, is in our own unrenewed spirits. I see but one prospect of happiness in life for you, Dora: it is in devoting yourself to others. Endeavour constantly and on all occasions to forget yourself, and to find out how you may best minister to the interests and wishes of those connected with you. There is nothing harsh in this but the sound, and nothing difficult but the first effort. To a loving spirit, the practice of self-denial becomes an easy task, a grateful duty that brings with it its own peaceful reward; and if ever, which God forbid, your young heart should be crushed with sorrow, you will find more solace in it than you can now understand. What is so beautiful as an unselfish character; and what so sure of winning love? And I know you value the love of others (of some at least) more than any earthly good. But you must not look for sympathy, my dear girl, in this world. Here and there you may find it perhaps, now and then, but not often; and it will be better for you to learn to do without it; you will more easily succeed in annihilating the selfish principle, that great foe to the moral improvement of our nature. And now, love, good night!" and Miss Vaughan kissed Dora and dismissed her, fearful lest her trembling voice should betray that very sympathy which she wished to teach her to do without, and humbled and convinced, yet greatly comforted, the poor girl sought her room.

The disappointment which Miss Vaughan had felt on finding that Dora had relapsed during her absence into her old fault vanished, as she watched her steady endeavour to put into practice the lesson she received that night. She well knew that a failing like hers was not to be overcome without repeated struggles; and she trusted to Dora's excellent sense and to her loving heart, through God's grace, to bring her forth victorious in the end. And she was not disappointed. Her resolution never varied from that time; and its effects were soon visible in her softened manner, her less abstracted look, and her ever ready kindness. All rejoiced in the change, and Dora was happier by being more beloved.

CHAPTER XVIII.

It is an evil incident to man
And of the worst that unexplored he leaves
Truths useful and attainable with ease,
To search forbidden depths where mystery lies
Not to be solved and useless if it might.
Mysteries are food for angels; they digest
With ease and find them nutriment; but man,
While yet he dwells below must stoop to glean
His manna from the ground or starve and die.

COWPER.

WITH feelings very different to those of the preceding year, the sisters now resumed their walks in the cold months of spring. Nothing escaped their quick eyes now; objects that they had not seen before, or had only lightly glanced at, were now replete with the deepest interest. Every sign of new life was carefully marked, and every flower welcomed at its coming. And those which had pleased them formerly filled them now with double admiration. The Violet had ever been a favourite, as it is with all, for its sweet perfume and its modest loveliness; but now they knew that the head which bent so gracefully down and hid itself under the broad leaves had a purpose in so doing—a task appointed to it to perform. They knew that it hung there not to please the eye of man only, but to guard the embryo seed, and protect it from the rain and cold dews that might retard its ripening. And when they saw the withered violets hold up their heads boldly, they knew that *that* was in obedience to another law of nature, in order that they might

obtain a better position for scattering the now ripened seed to a distance. In this and in a thousand things they traced the almighty power of God, and every wonder that met their eye increased their joy and thankfulness; and it was not the mere animal joy of existence that they experienced now. Like the young lambs, indeed, they felt that it was "a pleasant thing to be alive," but their hearts responded still more to the following words of that sweet hymn: "*They* cannot praise Him, *therefore* we are better than they. We cannot see Him for He is invisible; but we can see His works, and worship His footsteps in the green sod. They that know the most will praise God the best; but which of us can number half His works?"

The book of dried flowers was brought out once more, and the collection increased rapidly. By the close of the following summer they had obtained nearly 500 specimens, which after being pressed and dried were neatly arranged in a large book, and over each specimen was written the botanical and English name and the day of the month and name of the place in which it was gathered. Several excursions had been made to places at a distance, where there were chalky hills on which they expected to find certain flowers which they knew were peculiar to that sort of soil, but which they had never yet met with. Among these were the Pasque flower, so called, because it blooms about Easter time; the beautiful Polygala with its pink, blue, and white varieties. The small Woodruff, the wild Clematis, the Yellow-wort, the Blue Chicory, the Rock Rose, and the Fly and Bee-Orchis. All of these they were fortunate enough to find, at different times, to their very great satisfaction.

On one of these occasions, Fanny, after gathering something which she believed to be a common Orchis, threw it down again in alarm, thinking that a bee had settled upon it. What was the delight of the whole party on discovering the discarded flower to be the identical Bee-Orchis, for which they had so long searched in vain. They had not expected the deception to be so complete. But it was not in the field of botany exclusively, that Miss Vaughan sought to lead her pupils from nature up to nature's God. In the winter they read together many interesting works on various subjects. Geology, Zoology, Natural History, and Natural Philosophy by turns displayed their bright pages, and were eagerly investigated; and, at their own earnest request, she consented to unfold to their wondering minds some of the fascinating mysteries of Astronomy. There Dora's imagination revelled in a sea of new and ever increasing delight, and would as usual have overreached itself in its wild flight, had not Miss Vaughan's steady hand held the reins; but with that watchful guide she was safe. While discussing together the most usually received theories concerning those wonderful orbs which nightly meet our inquiring gaze, the suns, the systems, and the firmaments within firmaments stretching out into endless space, and overwhelming the astonished human reason with their unfathomable vastness and its own comparative insignificance, she would remind her, that however probable may be the ground for receiving such opinions, it is impossible to know with certainty any single fact respecting them. It is not even possible to know whether any of them be inhabited. As an eloquent writer has said, "that calm, earnest gaze with which they look

down upon us from their far abode has been the same since creation's dawn, and will be the same until the end of time, yet without revealing any thing." And therefore truth, the gem, the pearl of great price that we seek in knowledge, is not to be found in the science of Astronomy, elevating, sublime, and inspiring as its visions are. And this, Mary said, shewed the great advantage of Botany. Her mind, which was of a more practical mould, was in no danger of being carried away by any speculative science. She had a dislike to theory in general, and a strong disposition to reject wholly whatever did not admit of palpable proof. This disposition of course led to error in the opposite direction, and required regulating.

There can be no denying that our whole being is surrounded with deep and solemn mystery, which our finite mind cannot in its present state penetrate, but which may yet serve, if contemplated in an humble spirit, to aid our apprehension of the greatness of the Almighty Creator, and to increase our longing for the state of perfection to which the soul is ultimately destined, when the cloud that darkened it, and the tears that dimmed it here, shall be exhaled in the brightness of eternal day. With this idea impressed upon her, Mary followed her sister in the new pursuits, but with less ardour. Having made herself acquainted with all the positive facts connected with the subject, she returned with fresh zest to her first favourite study, and declared that not all the business or the pleasures nor any of the events of her after-life should ever tempt her to abandon it;—"though dear Miss Vaughan has her doubts;" she would add, as the latter smiled and kissed her bright happy face—"God only

knows, my love," was the answer, "what the events of your life may be, or what opportunity its weighty cares and duties may leave you for any private pursuit; but of one thing I feel satisfied, that while your purity of taste remains, which I earnestly trust and believe it ever will, you will never throw away in frivolous occupation any of the precious hours which may be left at your own disposal; for the mind that has once drunk of this pure fountain of pleasure can never return with relish to the muddy waters of earthly excitement and vanity."

CHAPTER XIX.

AND sweet it is the growth to trace,
Of worth, of intellect, of grace,
In bosoms where our labours first
Bid the young seed of spring-time burst
And lead it on from hour to hour,
To ripen into perfect flower. BOWRING.

FOUR happy years passed away while Miss Vaughan continued a member of Ash Grove Park. At the end of that period, a change occurred in Mrs. Hamilton's arrangements, in which was involved a separation from their beloved and deeply-valued governess. Dora was now eighteen years of age; and it was judged necessary that she should be introduced into society in the coming London season. Mary would follow her, and complete the ornamental part of her education under the superintendance of masters. With regard to Fanny there remained a difficulty. Rapid health had rendered her health delicate. The free exercise and pure country air, to which she had been accustomed, were considered indispensable to her; and it was feared she might suffer from the confinement and restriction of a town. Mrs. Hamilton had a great objection to schools for girls; and to place her little darling alone among strangers for the first time in her life, was an idea that was very painful to her; yet what was to be done. In this dilemma Miss Vaughan came forward to the general aid. Her own friends

resided in a healthy neighbourhood about a hundred miles from London; and it had long been her wish, in the event of leaving Ash Grove, to establish herself there with three or four pupils, in preference to entering a fresh family. Could this plan be carried into execution, she proposed to undertake the charge and education of Fanny in her own home. Nothing could exceed the satisfaction of Mr. and Mrs. Hamilton at this arrangement, which they knew would secure to Fanny every requisite advantage both for mind and body; and to no other care would they so willingly have consigned their precious child.

By their interest, three pupils were soon promised to Miss Vaughan; one of the same age as Fanny, the other two some years older; and it was necessary that she should go home immediately, to make preparations for their reception. Mrs. Hamilton intended to take the whole family to the sea-side for two or three months, and would return to Ash Grove only to make preparations for leaving it finally after Christmas, and to see Fanny comfortably settled in her new home before their departure to town. The grief of the latter, which had at first been almost desperate at the prospect of a separation from her parents, was gradually comforted; and at length she began to think herself almost an object of envy, on being the only one not going to be parted from Miss Vaughan. And, indeed, both Mary and Dora would gladly have exchanged places with her. The new scene about to open before them had little charm to their fancy. The "coming-out," to which girls are generally led to look forward as the farewell to lessons, and the beginning of the enjoyment of life, was a phrase to which

they had never attached any idea of enjoyment. To their ears, it sounded rather like a disagreeable necessity, an evil day that must at last put a period to the cherished pleasures of childhood, and enlist them as sharers in the responsibilities and duties of grown-up people. They did not complain, both because they had always been aware that this day must come sooner or later, and because they been accustomed to believe in the wisdom as well as the love of their parents, and quite convinced that they would not now (as they never had) compel them to submit to anything against their inclinations that was not necessary and right. Still it was a real grief, and to Dora, especially, one of a two-fold kind. Her timid nature shrank from the idea of entering the great world, in which she expected to meet but little congenial to her tastes; but worse, far worse than that, was the approaching separation from her best and dearly-valued friend.

It was the last evening, and they stood together, Dora and Miss Vaughan, on the edge of a little rising ground that overlooked the house and beautiful domain of Ash Grove. It had never looked so beautiful before, they thought, as on that autumn evening. The setting-sun threw a rich and mellow radiance upon the fading leaves, the smooth lawn, the green slopes, and on the little lake beneath; bathing it all in a golden light, that looked like the reflection of a beam from heaven. The nightingale warbled her long low note more plaintively even than of wont; and the cool breeze softly kissed their foreheads as it passed, and sighed far off among the leaves. There seemed to be all around a sympathy with the sadness of their feel-

ings; it was as if Nature herself mourned with them, and for them. But there were voiceless words of hope and comfort, too, which were not lost. Tears, vainly repressed, flowed down the cheeks of both; for this breaking up of the home was no small trial to Miss Vaughan, tutored as she had been in life's sad changes. Dora was dearer to her than she knew, and it had not been without a struggle that she had quietly checked the ardent affection with which the enthusiastic girl would have clung to her. For she knew that this day must come, and that her beloved charge must go alone to meet the conflict of the world (alone as regarded community of thought and feeling); and thence the whole object of her training had been to restore the balance of her mind, by educating, on the one hand, her common sense, and by restraining on the other, firmly, though tenderly, her marked sensitiveness, leading her to look for perfect sympathy to Him in whom *alone* it never fails.

Various are the trials in the life of a governess, but none, perhaps, so painful as its many partings. In close and constant intercourse with the children committed to her trust, reading their hearts, watching their development, struggling with their faults; and meanwhile daily sharing all their little hopes and pleasures, joys and sorrows; she can hardly fail to attach herself to them, and even, under congenial circumstances, to feel something almost of a mother's interest in their destiny, but when the seed is sown, her work is ended; others cull the fruit which she has watered with her tears, and her eyes seldom see it. Thoughts something like these forced themselves into Miss Vaughan's mind, as she looked her last upon the familiar scene. She did not speak,

but the sight of her silent tears unlocked the well of poor Dora's long pent-up feelings; and she threw herself down upon the grass, and wept in an agony of despair and sorrow. With gentle soothing words, Miss Vaughan sat down by her side and tried to comfort her. She spoke of the blessings that were her portion, the love by which she was surrounded, the means of doing good within her reach, and of many hopes and plans which she and her sister had formed together for the improvement of their time, during the intervals which they hoped would be allowed them between pleasures and gaieties; and above all, she dwelt on the unfailing love of Him from Whom no change can separate; of Him, Who had promised to be her guide in life and her guide in death; and to bring them both at length to the land where parting is unknown. And Dora grew calm; and checking, as she had learned to do, her over-excited feelings, she yielded herself to the cheering words and to the soothing influence of the sweet scene they still sat gazing upon. But there was melancholy even in her hopefulness.

"It reminds me of death," she said, in a low voice, her eyes following the fading light; "not only this peaceful evening, and the twilight stealing so softly on, but the change that is going to take place in our lives; this great event of going to London makes me think of death. Is it not strange?"

"I think not: it is natural, that when the mind is preparing itself for fresh events, and we are looking into a new path in the journey of life—it is natural that we should think of the end to which it leads: the end which must

come upon all things. And it is well that it should be so; it prevents our hearts from being too greatly moved by such events, whether joyful or sorrowful. We are travelling to another country; the journey will soon be over; and our deep concern should be, how we are to live in that country when we reach it: for we must live there for ever; and time is very short to lay up provision for eternity. We may well be anxious, and careful, and vigilant, and give ourselves no rest about *that*. But as for the way of our pilgrimage, as to how we shall fare upon the journey, we should think of it now, as we shall think of it when we look back, having reached the end. How will it seem then? Its griefs and vexations, its stirring events, its strong hopes, fears, and interests—how will they all seem when the naked soul stands shivering on the verge of the eternal world, its doom yet unpronounced? And when the portal is passed at length, and the blessing uttered, and the glory beheld, and the golden crown won, and cast at the feet of the Redeemer—how (looking back upon life's journey), how will it seem then? Will it be worth a single sigh, or a single thought? Shall we even be able to believe that we have ever spent a real regret about it? that we have wept because its road was rough, and hurt our feet, and because it was lonely and there was no light? Though the way was rough and steep, were there not everlasting arms ever ready to bear us up? and though it was lonely, was there not a Friend near to comfort us whenever we would turn to Him? And could we say that it was dark, when a light beamed ever brightly from the far-off land, when we would only raise our heavy eyes to look at it?"

"'O Father, not My will, but Thine, be done"!
So spake the Son.
Be this our charm, mellowing earth's ruder noise
Of griefs and joys;
That we may cling for ever to Thy breast,
In perfect rest.

"And may this perfect rest be yours, my beloved Dora: the perfect rest and the perfect peace, that earth is too poor to give, and too impotent to take away; and then I may hope that your life will pass happly on, and that, when its evening comes, it will be like the evening of this last day that we have spent together here, calm, and bright, and peaceful."

NEW AND POPULAR WORKS

FOR THE YOUNG,

PUBLISHED BY

GRANT AND GRIFFITH,

(SUCCESSORS TO NEWBERY AND HARRIS)

CORNER OF ST. PAUL'S CHURCH-YARD, LONDON.

PETER PARLEY'S NEW WORKS.

Faggots for the Fire Side;
Or, Fact and Fancy. By PETER PARLEY. With Twelve Tinted Illustrations. Foolscap 8vo., 4*s.* 6*d.*, cloth, elegant.

The Discontented Children;
And How they were Cured. By MARY and ELIZABETH KIRBY, Authors of "Stories from the Classics," etc. With Illustrations by HABLOT K. BROWNE (Phiz.). Small 4to.; price 2*s.* 6*d.* cloth; 3*s.* 6*d.* coloured, gilt edges.

Words by the Way Side;
Or, the Children and the Flowers. By EMILY AYTON. With Illustrations by H. ANELAY. Small 4to.; price 3*s.* 6*d.* cloth; 4*s.* 6*d.* coloured gilt edges.

Playing at Settlers; or, the Faggot House.
By MRS. R. LEE, Author of the "African Wanderers," "Anecdotes of Animals," "Adventures in Australia," etc. Small 4to.; price 2*s.* 6*d.* cloth; 3*s.* 6*d.* coloured, gilt edges.

The Remarkable History of the House that Jack Built. Splendidly Illustrated and magnificently Illuminated by THE SON OF A GENIUS. Price 2*s.* *in fancy cover.*

DURABLE BOOKS FOR SUNDAY READING.

Scenes from the Lives of Joseph and Moses.
With Illustrations by JOHN GILBERT, printed on Linen. Price 1*s.*

Scenes from the Life of Our Saviour.
With Illustrations by J. GILBERT, printed on Linen. Price 1*s.*

The Favourite Picture Book;

A Gallery of Delights, designed for the Amusement and Instruction of the Young. With several Hundred Illustrations by Eminent Artists. Royal 4to., price 3*s.* 6*d.*, bound in an Elegant Cover; 7*s.* 6*d.* coloured or mounted on cloth; 10*s.* 6*d.* mounted and coloured.

A Peep at the Pixies;

Or, Legends of the West. By Mrs. Bray. Illustrated by H. K. Browne (Phiz), 3*s.* 6*d.* cloth; 4*s.* 6*d.* coloured, gilt edges.

Ocean and her Rulers;

A Narrative of the Nations who have from the earliest ages held dominion over the Sea. By Alfred Elwes. With Frontispiece. Foolscap 8vo., 5*s.* cloth.

The Day of a Baby Boy;

A Story for a Young Child. By E. Berger. With Illustrations by John Absolon. Price 2*s.* 6*d.* cloth, plain; 3*s.* 6*d.* coloured, gilt edges.

Cat and Dog;

Or, Memoirs of Puss and the Captain. A Story founded on fact. By the Author of "The Doll and her Friends." Illustrated by H. Weir. 2nd Edition. Price 2*s.* 6*d.* cloth, plain; 3*s.* 6*d.* coloured, gilt edges.

ALFRED CROWQUILL'S COMICAL BOOKS.

Uniform in size with "The Struwwelpeter."

Picture Fables.

Written and Illustrated with Sixteen large coloured Plates by Alfred Crowquill. Price 2*s.* 6*d.*

The Careless Chicken;

By the Baron Krakemsides; With Sixteen large coloured Plates, by Alfred Crowquill. 4to., 2*s.* 6*d.*

Funny Leaves for the Younger Branches.

By the Baron Krakemsides, of Burstenoudelafen Castle. Illustrated by Alfred Crowquill. 4to, coloured plates, 2*s.* 6*d.*

Scripture Histories for Little Children.

By the author of "Mamma's Bible Stories," etc. With Sixteen Illustrations, by John Gilbert. 3*s.* plain; 4*s.* 6*d.* coloured.

The History of an Adopted Child.

By Geraldine E. Jewsbury, with an Illustration by John Absolon. Foolscap 8vo., price 4*s.* 6*d.* cloth.

The Family Bible Newly Opened;

With Uncle Goodwin's account of it. By Jefferys Taylor, author of "A Glance at the Globe," "The Young Islanders," etc. Frontispiece by John Gilbert. Fcap. 8vo., 4*s.* 6*d.* cloth.

Kate and Rosalind;

Or, Early Experiences. With an Illustration by J. GILBERT. Fcap. 8vo., price 4*s.* 6*d.* cloth.

Hidden Treasures;

Or, the Heir of Hohenberg. Edited by F. HARDMAN, Author of "The Student of Salamanca," etc., with Four Illustrations. Fcap. 8vo., 3*s.* 6*d.* cloth.

Good in Everything;

Or, The Early History of Gilbert Harland. By MRS. BARWELL, Author of "Little Lessons for Little Learners," etc. Illustrated by JOHN GILBERT. Royal 16mo., cl. 3*s.* 6*d.* plain; 4*s.* 6*d.*, cold., gilt edges.

WORKS BY MRS R. LEE.

Anecdotes of the Habits and Instincts of Animals.

By Mrs. R. LEE (formerly Mrs. Bowdich), with Illustrations by H. WEIR. Second Edition. Fcap. 8vo., 5*s.* cloth.

Anecdotes of the Habits and Instincts of Birds,

REPTILES, and FISHES. Illustrated by H. WEIR. Fcap. 8vo., 5*s.* cl.

Twelve Stories of the Sayings and Doings of

ANIMALS. With Four Illustrations by J. W. ARCHER. 2nd Edition, small 4to., cloth 2*s.* 6*d.* plain; 3*s.* 6*d.* coloured, gilt edges.

Adventures in Australia;

Or, the Wanderings of Captain Spencer in the Bush and the Wilds; containing accurate descriptions of the Habits of the Natives, and the Natural Productions and Features of the Country. Second Edition. With Illustrations by J. S. PROUT. Fcap. 8vo., 5*s.* cloth.

Familiar Natural History.

With Forty-two Illustrations from Drawings by HARRISON WEIR, and Descriptions by Mrs. LEE. Small 4to., cloth 3*s.* 6*d.* plain; 6*s.* coloured, gilt edges.

The African Wanderers;

Or, the Adventures of Carlos and Antonio; with Descriptions of the Manners and Customs of the Western Tribes, and the Natural Productions of the Country. 3rd Edit. With Engravings. Fcap. 8vo., 5*s.* cl.

"For fascinating adventure, and rapid succession of incident, the volume is equal to any relation of travel we ever read. It exhibits marked ability as well as extensive knowledge, and deserves perusal from all ages." *Britannia.*

"In strongly recommending this admirable work to the attention of young readers, we feel that we are rendering a real service to the cause of African civilization." *Patriot.*

WORKS BY W. H. G. KINGSTON.

Manco, the Peruvian Chief;

Or, the Adventures of an Englishman in the Country of the Incas. With Illustrations by CARL SCHMOLZE. Fcap. 8vo., 5*s.* cloth.

Mark Seaworth;

A Tale of the Indian Ocean. Illustrated by J. ABSOLON. Fcap. 8vo. 5*s.* cl.

Peter the Whaler;

His early Life and Adventures in the Arctic Regions. Second Edition. With Illustrations. Fcap. 8vo., 5*s.* cloth.

The Doll and Her Friends;

Or, Memoirs of the Lady Seraphina. By the Author of "Cat and Dog," etc. With Illustrations by H. K. BROWNE (Phiz). 2nd Edition, small 4to., cloth, 2*s.* 6*d.* plain; 3*s.* 6*d.* coloured, gilt edges.

Stories of Julian and his Playfellows.

Written by HIS MAMMA. With Illustrations by JOHN ABSOLON. Small 4to., 2*s.* 6*d.*, plain; 3*s.* 6*d.*, coloured, gilt edges.

Tales from Catland;

Written for Little Kittens by an OLD TABBY. With Four Illustrations by H. WEIR. Second Edit. Small 4to., 2*s.* 6*d.* plain; 3*s.* 6*d.* coloured.

The Wonders of Home, in Eleven Stories.

By GRANDFATHER GREY. Second Edition. With Illustrations. Royal 16mo., price 3*s.* 6*d.* cloth; 4*s.* 6*d.* coloured.

CONTENTS.—1. The Story of a Cup of Tea.—2. A Lump of Coal.—3. Some Hot Water.—4. A Piece of Sugar.—5. The Milk Jug.—6. A Pin.—7. Jenny's Sash.—8. Harry's Jacket.—9. A Tumbler.—10. A Knife.—11. This Book.

"The idea is excellent, and its execution equally commendable. The subjects are well selected, and are very happily told in a light yet sensible manner."—*Weekly News.*

Tales of School Life.

By AGNES LOUDON, Author of "Tales for Young People." With Four beautiful Illustrations by JOHN ABSOLON. Second Edition. Royal 16mo., price 3*s.* 6*d.* plain; 4*s.* 6*d.* coloured.

"These reminiscences of school days will be recognised as truthful pictures of every-day occurrence. The style is colloquial and pleasant, and therefore well suited to those for whose perusal it is intended."—*Athenæum.*

Rhymes of Royalty.

The History of England in Verse, from the Norman Conquest to the reign of QUEEN VICTORIA; with an Appendix, comprising a summary of the leading events in each reign. Fcap. 8vo., with an Elegant Frontispiece. Price 2*s.* 6*d.* cloth.

Kit Bam's Adventures;

Or, the Yarns of an Old Mariner. By MARY COWDEN CLARKE. With Illustrations by GEORGE CRUIKSHANK. Fcap. 8vo., price 3*s.* 6*d.* cloth.

"A more captivating volume for juvenile recreative reading we never remember to have seen."—*Standard of Freedom.*

"Cruikshank's illustrations are worthy of his genius. There is a giant and a dwarf, which he never could have drawn, if he had not lived in fairy land."—*Examiner.*

Every-Day Things;

Or, Useful Knowledge respecting the principal Animal, Vegetable, and Mineral Substances in common use. Written for Young Persons, by A LADY. 18mo., 2*s.* cloth.

"A little encyc'opædia of useful knowledge, deserving a place in every juvenile library."—*Evangelical Magazine.*

The History of a Family;

Or, Religion our best Support. With an Illustration by JOHN ABSOLON. Fcap. 8vo., price 2*s.* 6*d.* cloth.

"A natural and gracefully written story, pervaded by a tone of Scriptural piety, and well calculated to foster just views of life and duty. We hope it will find its way into many English homes."—*Englishwoman's Magazine.*

Facts from the World of Nature;

ANIMATE and INANIMATE. Part 1. The Earth. Part 2. The Waters. Part 3. Atmospheric Phenomena. Part 4. Animal Life. By Mrs. LOUDON. With numerous Illustrations on Wood, and a beautiful Frontispiece engraved on Steel. Fcap. 8vo., price 5*s.* cloth.

"A volume as charming as it is useful."—*Church and State Gazette.*

"The young reader is conducted through each region of creation, and has its chief wonders unfolded to him by one of the pleasantest of guides."—*Manchester Examiner.*

The First Book of Geography;

Specially adapted as a Text Book for Beginners, and as a Guide to the Young Teacher. By HUGO REID, author of "Elements of Astronomy," etc. Second Edition, revised. 18mo., price 1*s.* sewed.

"One of the most sensible little books on the subject of Geography we have met with."—*Educational Times.*

Visits to Beechwood Farm;

Or, Country Pleasures, and Hints for Happiness addressed to the Young. By CATHERINE M. A. COUPER. Four beautiful Illustrations by ABSOLON. Small 4to., price 3*s.* 6*d.*, plain.

MARIN DE LA VOYE'S ELEMENTARY FRENCH WORKS.

Les Jeunes Narrateurs;

Ou Petits Contes Moraux. With a Key to the difficult words and phrases. 18mo., price 2*s.* cloth.

The Pictorial French Grammar;

For the Use of Children. With Eighty Illustrations. Royal 16mo., price 2*s.* illuminated cloth.

The Wonder Seeker;

Or, The History of Charles Douglas. By M. F. TYTLER. With Illustrations by ABSOLON. Second Edition. Fcap. 8vo., price 3*s.* 6*d.* cloth; 4*s.* 6*d.*, coloured, gilt edges.

Early Days of English Princes.

By Mrs. RUSSELL GRAY. Dedicated by permission to the Duchess of Roxburghe. With Illustrations by JOHN FRANKLIN. Small 4to., price 3*s.* 6*d.*, tinted plates, 4*s.* 6*d*, coloured. Cloth.

Glimpses of Nature;

And Objects of Interest described during a Visit to the Isle of Wight. Designed to assist and encourage Young Persons in forming habits of observation. By Mrs. LOUDON. Second Edition, with additional Illustrations, and a new Chapter on Shells. 16mo., price 3*s.* 6*d.* cloth.

"We could not recommend a more valuable little volume. It is full of information, conveyed in the most agreeable manner."—*Literary Gazette.*

Home Amusements.

A Collection of Riddles, Charades, Conundrums, Parlour Games, and Forfeits. New Edition, with Frontispiece. Price 2*s.* 6*d.* cloth.

WORKS BY THE AUTHOR OF MAMMA'S BIBLE STORIES.

Fanny and her Mamma;

Or, Lessons for Children. In which it is attempted to bring Scriptural Principles into daily practice; with Hints on Nursery Discipline. Illustrated by J. GILBERT. Second Edition. 16mo., price 2*s.* 6*d.* cloth; 3*s.* 6*d.* coloured, gilt edges.

Bible Scenes;

Or, Sunday Employment for Very Little Children. Consisting of Twelve Coloured Illustrations on Cards, and the History written in Simple Language. In a neat box. Price 3*s.* 6*d.*; or dissected as a Puzzle, price 6*s.* 6*d.*

FIRST SERIES.—JOSEPH.
SECOND SERIES.—OUR SAVIOUR.
THIRD SERIES.—MOSES.
FOURTH SERIES.—MIRACLES OF CHRIST.

Mamma's Bible Stories,

For her Little Boys and Girls. Ninth and cheaper Edition. Twelve Engravings. 2*s.* 6*d.* cloth; 3*s.* 6*d.* coloured, gilt edges.

A Sequel to Mamma's Bible Stories.

Third Edition. Twelve Engravings. Price 3*s.* 6*d.* cloth.

Short and Simple Prayers,

For the Use of Young Children. With Hymns. Third Edition. Square 16mo., price 1*s.* 6*d.* cloth.

"Well adapted to the capacities of children—beginning with the simplest forms which the youngest child may lisp at its mother's knee, and proceeding with those suited to its gradually advancing age. Special prayers, designed for particular circumstances and are added. We cordially recommend the book."—*Christian Guardian.*

The Celestial Empire;

or, Points and Pickings of Information about China and the Chinese. By the Author of "Paul Preston," "Soldiers and Sailors," etc. With Twenty Engravings. Fcap. 8vo., price 3*s.* 6*d.*, cloth.

"This very handsome volume contains an almost incredible amount of information."—*Church and State Gazette.*

The Silver Swan;

A Fairy Tale. By MADAME DE CHATELAIN. Illustrated by JOHN LEECH. Small 4to., price 3*s.* 6*d.* plain; 4*s.* 6*d.* coloured.

"The moral is in the good, broad, unmistakeable style of the best fairy period."—*Athenæum.*
"The story is written with excellent taste and sly humour."—*Atlas.*

The Young Jewess and her Christian School-fellows.

By the Author of "Rhoda," etc. With a Frontispiece by J. GILBERT. 16mo., price 1*s.* 6*d.* cloth.

"Peculiarly adapted to impress upon the minds of young persons the powerful efficacy of example."—*Englishman's Magazine.*

Rhoda;

Or, The Excellence of Charity. Third Edition. With Three Illustrations by WILLIAMS. Square 16mo., price 2*s.* cloth.

"Not only adapted for children, but many parents might derive great advantage from studying its simple truths."—*Church and State Gazette.*

Stories from the Old and New Testaments,

On an improved plan. By the Rev. B. H. DRAPER. With 48 Engravings. Fifth Edition. Price 5*s.* cloth.

Wars of the Jews,

As related by JOSEPHUS; adapted to the Capacities of Young Persons, and illustrated with 24 Engravings. Fifth Edition. Price 4*s.* 6*d.* cl.

True Stories from Ancient History,

Chronologically arranged from the Creation of the World to the Death of Charlemagne. By the Author of "Always Happy," etc. Eleventh Edition. 24 Engravings. 12mo. Price 5*s.* cloth.

True Stories from Modern History,

Chronologically arranged from the Death of Charlemagne to the Year 1849. Seventh Edition. 24 Engravings. 12mo., 5*s.* cloth.

True Stories from English History,

Chronologically arranged from the Invasion of the Romans to the Present Time. Sixth Edition. 36 Engravings. 5*s.* cloth.

Trimmer's Concise History of England,

With a Continuation to the Reign of Victoria, by Mrs. MILNER, Author of "Life of Dean Milner," etc. With Illustrations. New and Cheaper Edition. In one volume, fcap. 8vo., price 5*s.* cloth.

First Steps in Scottish History,

By Miss RODWELL, Author of "First Steps to English History," etc. With 10 Illustrations by WEIGALL. 3*s.* 6*d.* plain; 4*s.* 6*d.* coloured.

The Prince of Wales' Primer.

Dedicated to her Majesty Queen Victoria. New Edition, with 300 Engravings. Price 6*d.*; or Title, Frontispiece, and Cover printed in Gold and Colours, 1*s.*

Anecdotes of Kings.

Selected from History; or, Gertrude's Stories for Children. New Edition. With Engravings, 2*s.* 6*d.* plain; 3*s.* 6*d.* coloured.

Bible Illustrations;

Or, a Description of Manners and Customs peculiar to the East, and especially Explanatory of the Holy Scriptures. By the Rev. B. H. DRAPER. With Illustrations. Fourth Edition. Revised by Dr. KITTO, Editor of "The Pictorial Bible." Price 3*s.* 6*d.* cloth.

The British History briefly told,

and a Description of the Ancient Customs, Sports, and Pastimes of the English. With full-length Portraits of the Sovereigns in their proper Costumes, and 18 other Engravings. Price 3*s.* 6*d.* cloth.

Facts to correct Fancies;

Or, Short Narratives compiled from the Biography of Remarkable Women. By a MOTHER. With Engravings, 3*s.* 6*d.* plain; 4*s.* 6*d.* coloured.

Key to Knowledge;

Or, Things in Common Use simply and shortly Explained. By a MOTHER, Author of "Always Happy," etc. Twelfth Edition. With numerous Illustrations. Price 3*s.* 6*d.* coloured.

The Mine;

Or, Subterranean Wonders. An Account of the Operations of the Miner and the Products of his Labours. By the late Rev. ISAAC TAYLOR. Sixth Edition. With Corrections and Additions by Mrs. LOUDON. 45 new Woodcuts and Steel Engravings. Price 3*s.* 6*d.* cloth.

The Ship;

A Description of different kinds of Vessels, the Origin of Ship-building, a Brief Sketch of Naval Affairs, with the Distinctive Flags of different Nations, and numerous illustrative Engravings. By the late Rev. ISAAC TAYLOR. Fifth Edition. Edited by M. H. BARKER, Esq., "The Old Sailor." Price 3*s.* 6*d.* cloth.

WERTHEIMER AND CO. PRINTERS, FINSBURY CIRCUS.